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MIND

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OF

PSYCHOLOGY AND PHILOSOPHY.

I.—Mr. JAMES WARD'S "PSYCHOLOGY".[1]

By Professor Alexander Bain.

It had been known for some time that Mr. James Ward would contribute to the *Encyclopædia Britannica* the important article "Psychology"; and the expectations formed of it were very high. Allowance being made for the limited space, these expectations have been amply justified. The thorough knowledge of previous works, the freshness of the handling, the never failing acuteness, the light thrown upon many of the dark places of mental science,—constitute the work a signal achievement of philosophical ability. Much that belongs to a full exposition is necessarily omitted; and the problems commonly called 'philosophical' and also 'metaphysical,' are not comprised. The work has the rare merit of being Psychology, and nothing but Psychology. It is nearly complete as regards fundamental problems, and the ultimate analysis of the distinctive properties of mind: a densely-packed dissertation, abounding in clear, though brief, indications of the author's mode of solving the long-standing difficulties of our mental constitution.

Of course, the starting-point is the definition of Mind,

[1] *Encyclopædia Britannica*, xx., 37-85.

which must be at best provisional at the outset. Mr. Ward, in his first section, "The Standpoint of Psychology," proceeds by remarking first on the contrast of Internal and External, which is fallacious from the failure of space-relations in speaking of the mind as compared with the body. This he indicates as clearly as could be done, without anticipating a difficult problem. The second contrast—Mental and Material—he also disposes of with equal justice. He does not, for some reason, avail himself of an enumeration of physical properties—Extension, Resistance, and so on—to lead up to the ambiguous borderland of matter and mind; but he allows us to feel at once that the transcendental question of an external world must be reckoned with, if not satisfactorily disposed of, in order to make this contrast the basis of a definition. His own definition turns upon the word 'individualistic'; which is not to define by subject-matter, but by the standpoint for viewing our experience. His real definition for expository purposes consists in enumerating the ultimate constituents of mind, very much as is done by everybody in the present day.

Leaving the definition, we are invited to discuss the "General Analysis of Mind; its Ultimate Constituents". There cannot be less than three, as in the propositions—I feel somehow, I know something, I do something. But now—who is 'I'. Must there not be an entity distinct from feeling, knowing and doing, and having a common relation to all the three? On this point Mr. Ward is very decided. Everything mental must be referred to a Self; something of the nature of the pure Ego of Kant, which he opposed to the empirical Ego. Previous attempts to extricate the subject are severely criticised in their order. The nature of such criticism will be appreciated if we take up the first of them.

According to Hume, the mind or soul is simply "the name for the series of mental phenomena which make up an individual mind". But as we undoubtedly are self-conscious beings, that is, are aware of what happens to us as recipients of impressions, and affected in various ways, how can a series be aware of itself? Agent and patient are never together in the same act. Knowing and known must be different.

As to "a series of states being aware of itself," I confess I see no insurmountable difficulty. It may be a fact, or not a fact; it may be a very clumsy expression for what it is applied to; but it is neither paradox nor self-contradiction. A "series" merely contradicts an individual, or it may be

two or more individuals as co-existing; but that is too general to exclude the possibility of self-knowledge. It certainly does not bring the property of self-knowledge into the foreground, which, however, is not the same as denying it. An algebraic series might know itself, without any contradiction: the only thing against it is the want of evidence of fact. So, again, the word "state" is equally guiltless of denying self-knowledge; its fault is that it is so general as hardly to deny anything.

We have undoubtedly got into the way of describing our mental furniture by a verb whose grammatical subject is 'I' or 'We'. Is this merely figurative, or is it the one and only way of stating the phenomena? If it is a figure, the figure may change; if it is more than a figure, if it is the only adequate description of the situation, it certainly commits us to Mr. Ward's conclusion that there is a subject more or less different from the acts of knowing, feeling and acting.

I am not, however, convinced of the absolute, indefeasible necessity of adopting this form of language. In speaking of our mental energies, we can hardly avoid some sort of personification; at least, we find it a convenience and a facility to have a something 'in the chair,' through whom the actions and re-actions of the mind can take place. But what the chairman is to be in his own independent character, is not so easy to settle. One quality of the subject, which Mr. Ward lays great stress upon, is re-active attention, by which the mere physical intensity of sensation is heightened, other things remaining the same. But, as we proceed, we find the properties of the Subject gradually extended, until in the final formula for the ultimate constituents of mind, it absorbs all the three elementary properties — cognition, feeling and conation—and leaves only sensory and motor presentations, or what we should call 'sensation,' were it not that the element of feeling is withdrawn.

It is this final aggrandisement of the Subject that staggers me. In fact, it is the whole mind, with the exception of the first impressions of sense considered purely as elements of knowledge. The active verb 'I feel' is not analysed into a subject that feels and a state of pleasure or pain. But the total capacities of the mind, in respect of feelings, will and the higher elaboration of knowledge, make a Subject, to which our first impressions of the object-world constitute the object. It is only with knowledge that the division into the knowing and the known is imperative, on pain of self-contradiction.

But Mr. Ward does not seem to me to hold steadily by the Subject, as thus made up. Immediately after giving his tabular scheme, he says that "reproduction, association, agreement, difference, and all varieties of thinking and acting, are to be explained by the laws pertaining to ideas or presentations, leaving to the Subject the one power of variously distributing that attention upon which the intensity of a sensation in part depends". Again he gives us three irreducible facts—attention, feeling, and objects or presentations —the two first being subject. He admits that it looks paradoxical to say that we have no knowledge but of presentations; and replies that attention and feeling are known indirectly by their effects upon presentations, while the subject *quâ* subject cannot be presented.

Now, it is our duty to receive any suggestions calculated to improve our nomenclature of the ultimate facts of mind. I accept the doctrine of the Subject in the meantime, with certain provisos. One is that it shall not be a nucleus and hiding-place of mysticism; another, that I may take it up and put it down as may seem convenient. I admit, however, that this last begs the question at issue, namely, whether it is any more than a verbal convenience, or useful fiction. Yet, I do not see any insuperable difficulty in making the mind the collective 'Ego,' when Mr. Ward admits that the three facts, Feeling, Conation, Cognition, include everything. Kant's pure Ego would seem to be a much more attenuated article than Mr. Ward's, which includes the whole of Attention, the whole of Feeling, and a somewhat uncertain share of Cognition.

I do not find that, in the later disquisitions on Feeling and Will, much is made of the circumstance that these two go far to make up the subject, to which all knowledge from the outer world is addressed. At the same time, I am aware that the recognition of Subject in some such way as here proposed will be productive of comfort to many persons.

Mr. Ward's next important innovation in the treatment of fundamentals is his mode of expressing the unity of consciousness by the term "continuum," as a substitute for the old designations—train, series, sequence, transition. He thinks that by the usual modes, the discreteness of the successive individual presentations is made too much of, and the continuity too little. He argues that a mental succession must be treated as a whole, for two reasons. The first is grounded on fact, namely, that special attention to any single member diminishes the intensity of presentation of the rest, while the recurrence of one by association entails the re-presenta-

tion of the other. The second is a matter of hypothesis, which is, that the distinctness of the separate members of our mental trains grew out of a process of differentiation from a primitive homogeneous current.

Now it is obvious that our language must provide for both the separateness and the unity or continuity of the stream of thought. Yet my fear is that "continuum" rather inclines us too much to the other extreme. Moreover, I am not aware of any erroneous tendencies due to the previous phraseology; at all events, I think it could be used without implying any dangerous amount of independence among the terms of mental succession. A train of impressions, presentations, ideas, may have any amount of coherence and dependence, that we may choose to assign; while the word does not sink the circumstance of plurality. That the successive members of a train should be regarded as parts of one whole, is not only unnecessary but misleading. The idea of part and whole is extended beyond ordinary usage; in the same way that 'redintegration' expresses too much as a name for reproduction by means of association. Except as a variety of expression suitable on occasions when the continuity of a series of states has to be emphatically set forth, I am not convinced of the need for this innovation. The hypothesis of differentiation will come up again.

Before finishing his survey of fundamentals, Mr. Ward discusses particularly the motor presentations or movements; and connects with the discussion the germs or beginnings of Conation or Action. We are here at once in the very heart of abstruse psychological theory. It is better for us, however, in our review, to pass on till the handling of the will is given in all its completeness. We shall therefore consider that the fundamentals have been given, and proceed to the detailed and systematic working out.

The commencing topic is "Theory of Presentations," and this is followed by related matters under the head of Cognition, as Sensation and Movement, Perception, Ideation or Imagination, Association. Feeling is in abeyance throughout.

The starting-point is Differentiation from a primary homogeneous continuum. "Psychologists have usually represented mental advance as consisting fundamentally in the combination and re-combination of various elementary units, the so-called sensations and primitive movements, or, in other words, in a species of mental chemistry." Not altogether without reason, as it seems to me. Our education from first to last takes principally the form of adding unit to unit,

under the retentive or adhesive attribute of our nature, with which we are so marvellously gifted; and any other process of development is quite secondary in comparison. If we add the great extension of our resources by similarity, or transferring old adhesions to new connexions, I think there is comparatively little left to correspond to a process of differentiation. There is indeed something, and that something is also of importance, namely, improvement in our powers of discrimination. Even our primary sensibility to differences of colour, or tone, can be cultivated, as is generally believed; and we may, if we please, call this "differentiation of a continuum". To take Mr. Ward's example, the steel-worker sees half-a-dozen tints, where others see only a uniform glow. It is to my mind sufficient to describe this as the education or cultivation of a difference. I see nothing gained by stating it otherwise. Every new shade of difference is a new presentation. If I were to use the word "differentiating" I would not couple it with a continuum, but with a uniform effect: continuity, in the meaning of sequence, has no relevance.

With many of Mr. Ward's statements as to the facts of our presentations I thoroughly agree. I perfectly admit that what we usually call a sensation of one of the senses does not typify an elementary presentation. I also admit what he says as to one circumstance in the effect of repetition upon our sensations, namely, when they are complex, as from a flower, to make us more and more cognisant of the details. But when the sensation is simple, as the colour of gold, or when the details of a complex sensation have been mastered, repetition has the effect of deepening the impression on the memory and nothing else.

An interesting discussion follows on "latent mental modifications," which the author transforms into a doctrine of "sub-consciousness," all which I think happy. Our consciousness at any moment can be distinguished into a centre or focus of attention, and a wider field, over which attention may range so as to shift the focus from one moment to another. Outside this field are presentations just out of consciousness, and ready to be brought in by the slightest accessions of relative intensity which may come over them, even though they are not in the field. These are "sub-conscious" states, and the designation is a useful addition to our nomenclature. We have never, I think, taken sufficient notice of the multitude of *recent* impressions, that are a power in our minds, from their readiness to appear in consciousness again and again, and which serve as guides to immediate action in our

numerous everyday requirements. While many of them serve the purposes of the hour and pass out of view for ever, some are on the way to become permanent possessions of the mind: all our fixed recollections must needs pass through this stage.

Next follows the thorny subject of the Law of Relativity, against which in its unqualified sense Mr. Ward advances various objections, some of them exceedingly cogent. That transition or difference is a commanding element of our consciousness is shown in numerous instances: passing from cold to heat, dark to light, down to up, weakness to power, fear to security, poverty to wealth, familiarity to surprise. The practical bearing of such cases is this: a present state affects us only with reference to a prior; the hand immersed in water at 60° may have a very different actual sensation according to its previous contact. Taken out of water at 40° the sensation will be warmth, out of 90° it will be coldness. So with light: going out of a bright light into a comparative shade we at first consider ourselves in total darkness; as the previous impression dies away, we begin to see objects more and more clearly. Animals living in an even temperature never have any sensation of heat or cold. The pressure of the air is unfelt by us until we change its degree. Mr. Ward remarks, what will not be denied, that the transition may be from a neutral temperature; but that makes no difference to the principle of change. The obstacle to the universality of the principle arises when we pass from difference of intensity to difference of *quality* in the same class of sensations, as sweet and bitter in taste, or red and blue in colour. Taking degrees of sweetness, a present sweet might seem different according to its preceding sensation, but it has a certain fixity of character under every possible antecedent; there is a limitation to the changes that relativity can induce. The previous state does not entirely make it, and yet operates to modify it. So with colours. Red has an absolute character, whether preceded by light, dark, blue, yellow. Nevertheless there is a certain slight variation of quality, according to the previous state, as might be shown in the judgment of the exact shade. Probably the permanent image of a given red is altered by a large experience of colours, with which it has to be brought into contrast from time to time, while logically its meaning is increased by the number of exclusions or negations corresponding to its affirmation. Mr. Ward further puts the case of sensations of different senses, where the relativity is still more remote, although doubt-

less exercising some power. To a being with only one sense, the experience of sensations of that sense would not be exactly the same as to us, who bring five senses into comparison.

On the whole, I am quite disposed to acquiesce in Mr. Ward's conclusion, that while there is no unalterably fixed unit in sensations, the mutual relations of impressions are not everything. I am concerned only to uphold certain positions that constantly meet us in practice, as well as in theory. Thus, (1) change of impression is essential to consciousness of any kind, and the intensity of the consciousness is determined by the amount or interval of the change,—a matter of the greatest moment in the question as to conscious intensity, for which the comprehensive title is now to be Attention. (2) We cannot assign the consciousness due to any present stimulus without taking account of the state of mind previous, innumerable fallacies of judgment being the consequence of overlooking this principle. Among important applications of the general law is this : a term or quality has no meaning till we have experienced some opposite to it, if only a change in degree. Our first parents did not at first know the meaning of obedience. The Australians, who never had a stimulant until the British occupation of their territory, did not know that they were temperate; those that now take the pledge understand it.

Under the head " Sensation and Movement " there is first the inquiry as to whether qualitative difference in sensation is not resolvable into variety in the arrangement and intensity of the aggregation of primitive homogeneous units. There is much to be said for this as an interesting speculation. Another point urged is that all possible sensations of colour, tone, temperature constitute groups of qualitative continua. This applies to cases where the changes are made by imperceptible gradations ; while the transitions that are in their nature abrupt, as the change from a smell to a taste, or from sweet to bitter, constitute a distinct class. The hypothetical explanation of the last is a higher degree of complexity.

As regards movements and motor presentations, the want of qualitative difference is notable. Mr. Ward divides them into two classes—motor presentations proper, involving feeling of muscular effort, and auxilio-motor, due to the straining of tendons, stretching of the skin, &c. He says nothing of the sensibility due to the afferent nerve-fibres in muscle, which are not there for nothing. Nor does he either affirm or deny the position that the motor currents are

accompanied with consciousness. Indeed his references to the physical side of mental facts seem somewhat capricious, his tendency, on the whole, being to discount it as an aid to psychical explanation.

"Perception" introduces us to various subtle disquisitions. First, as to its meaning. For one thing, it is an advance upon differentiation, by supposing integration at work. For another thing, it connects sensations with movements in the way of purposive action. The presentation-continuum would not be knowledge but for the intervention of controlling movements. This, however, is the problem of the will, and I must reserve it and take what belongs to perception in the more purely intellectual definition.

Three meanings emerge. First, there is recognition, by assimilation, or the more or less definite revival of the residua of former resembling presentations. This is the first employment of the recovery of the past by similarity. We begin with difference; repetition follows, and we assimilate without at first knowing it. "Assimilation involves retentiveness and differentiation, and prepares the way for re-presentation; but in itself there is no confronting the new with the old, no determination of likeness, and no subsequent classification." At this stage we are to beware of speaking of the reproduction of past sensations; there is as yet no individuality, and therefore no reproduction. There is simply an unconscious fusion of the repeated impressions, by which their character is advanced above the first stage of mere differentiation; which, however, is a step towards perception.

The second meaning is something much higher. Perception is the localisation of impressions, the referring of them to a part of the surface of the body or to some foreign body beyond. This is the problem of the origin of our notion of Space, and on that problem we must here enter, taking due care to separate space in the abstract from concrete spatial experience,—what Hamilton called the empirical notion of space, which the most thorough-going *à priori* philosopher must allow to be a matter for resolution or analysis.

Empirical psychologists, by starting with the simultaneous plurality of sensations, first in touch, and afterwards in sight, and by a copious employment of the resources of movement and of muscular resistance and freedom, have hitherto supposed that they account for all that there is in our notion of space or extension. Mr. Ward says, No. If we had only these to depend upon, we should go down to our graves with our intellects spaceless. What then is lacking? These two things:—

(1) The varying sense of the massiveness of sensations, spoken of by Mr. Ward under the new coinage "Extensity". An increase in the mass affects us differently from an increase in the intensity. Putting the finger alone into hot water and then the whole hand increases the mass of sensibility, and we are aware of the increase; and in this difference we have the beginning, or basis of operations, of the notion of space.

(2) The existence of Local Signs in different parts of the body, as suggested by Lotze, and elaborated by Wundt. That is to say, underneath the apparent identity of touches in different parts of the skin there are latent differences that operate in making us feel that repetition or plurality cannot be on the same spot.

A word upon each of these hypotheses. The importance of massiveness, as going along with simultaneous plurality, may be readily admitted. A single contact on the tip of the finger proves nothing, a double contact essentially requires a change of spot, and a multiplicity of contacts is compatible only with that expansion of surface that is otherwise revealed by greater massiveness, the consequence of a wider contact. But I am inclined to think that the massiveness operates as a basis of plurality, and somehow in concurrence with that, and not from any suggestiveness in itself.

The existence of distinguishable signs all over the body, even without conscious difference, has always seemed to me to be something of a paradox, notwithstanding their acceptance by able psychologists. There is a remarkable sameness of quality in our tactile feelings on every part of the skin; so much so that we scarcely ever in practice remark any difference except in their locality. When we are put to it, we must admit that there are anatomical grounds for variety, as Mr. Ward points out: the difference of the underlying parts—in one place bone, in another tendon, in a third fatty tissue—should make a qualitative difference of sensation; and by attending to such differences we should know whether a contact is on a hard part or a soft, on the upper surface of the foot or the heel. But not to speak of the substantial sameness of the two sides of the body, there are large portions of the skin with identical subjacent parts; and our sense of local differences would appear to be as good where the identity is most complete as where it is most wanting.

Although, in this great question, it is right to begin with Touch, we must end with Sight; for it is visible extension that is our standing mental representation of space. Now, take the starry sky, where one star differs from another in

local colouring. Let us suppose that the heavens were made up of stars without such difference: would anyone in that case contend that our visible conception of space must prove abortive?

Mr. Ward handles with great success the play of movements in developing our notion of space. In all this he is on secure ground, and I cannot help thinking that, without either of his two subtleties of "extensity" and local signs, the capabilities of movement, working upon simultaneous plurality, would carry him to his journey's end.

The third meaning of Perception is a great meaning—the Intuition of Reality or Actuality. Here he adverts very properly to our sense of resistance in giving us 'body,' and the fixity of order of some impressions, as connected with external reality; while he blames empirical psychologists for not considering that the point of fixed order is essential. He puts it to those that make so much of the law of similarity, why it is that this does not override contiguity, and make the white of snow lead to a classing of whites, instead of a grouping of the associated qualities of coldness and powdery softness. Then comes the question of unity in the midst of change, and that leads to another—continuity in time, or *persistence*. For this the first datum is our body, which we never part with, whereby we are prepared for regarding the re-appearance of other bodies, after absence, as the continuance of the same, and not the appearance of others resembling. And finally, the quality of physical solidity, affecting our sense of resistance, is the groundwork of all substantiality, continuance and invariability.

This concludes Perception. Next comes "Imagination or Ideation," as rising above perception. The handling of this large subject is a good test of psychological ability. Starting from Hume's very imperfect account of the distinction between impressions and images, our author first warns us that there are no ideas answering to simple or isolated impressions, as redness by itself; what are revived in memory and imagination are *percepts*, not unlocalised sensations and movements. Our idea of red is some red thing originally a percept. Ideas are the material of association proper. There is a grouping of distinct elements in the percept: this Mr. Ward prefers to call "complication," although of course he would not deny that it involves the retentive power of the mind.

The criticism of the weak points of Hume's distinction between presentations and images as consisting in superior force and liveliness is just and well-put. However faint a primary impression may be it has a steadiness and fixity all

its own, besides the localisation accompanying every percept, whereby each excludes every other for the time. Here, however, arises a nice question. We can overlay a percept with an idea of a contradictory nature. We can look at a blue starry sky and imagine a gorgeous sunset, two things incompatible in actual perception. This shows, Mr. Ward thinks, that images float in a level of their own, quite above the presentation-continuum, and to this independent flux he would give the name of a "representation- or memory-continuum," which he justifies later on.

So much for the difference of presentation and image; now for the connexion of the two. It is obvious that the presentation is the source of the image, and we are justified in assuming a transition from the one to the other. There is an intermediate stage, called by Fechner the memory-after-image, being the trace left by an impression after it has ceased. This may easily be distinguished from morbid persistence in a sensation itself, which has its own characters and contributes nothing to the formation of images or ideas.

The evolving of the full-fledged image or idea from the memory-image is a stiff business, and not without uncertainties. The memory-image has already lost the essential characters of the impression, and especially the stubborn resistance to superposition of impressions; for several may be in the field of consciousness together. It has made its mark as a thing persisting apart from its original presentation, and what we need farther is a confirmation and deepening of this by subsequent renewals. What happens, then, on a second presentation, which also leaves its memory-image to fuse with the first? Here Mr. Ward speaks in metaphors that are not quite clear. The revival of the image is not another birth, whatever that may mean. There is, in the case of an identical image, assimilation or recognition, which precludes individual distinctness. If the second impression occurred in identical surroundings there would be no sense of distinctness; when the surroundings are changed there is sense of distinctness; nevertheless, repetition brings confirmation, being the case of similarity working in diversity. On the whole I call this an extremely laboured attempt to bring out the simple result of confirmation of images by repeated occurrence, there being more or less of identity in their accompaniments.

The author is now brought face to face with "Mental Association," although his treatment is avowedly cursory. He appears to join the small company that would reduce the two principles of Contiguity and Similarity to one.

That is to say, there is such a thing as revival by similarity, but this is not a process of association. If he means that 'association' is not an apt word for the suggestion of similars, I quite agree with him. That there is nothing to be said, however, as to the workings of Similarity as such, I could not admit without a degree of self-stultification that I am not yet equal to. Meantime, I must endeavour to follow his account of his one recognised law of association—Contiguity. He re-introduces his memory-continuum to get out of the enormous difficulty of conceiving presentations originally distinct and isolated becoming eventually linked together. For contiguity he would substitute "continuity," and inquire into the process of integration, in all which I can see only a change of terms for the same inevitable fact: *a*, *b*, *c*, *d*, began by being isolated presentations, they end by being linked or connected into a series.

Still there are considerations of some subtlety in the matter. Take, first, succession. Why does not this association work backwards? This, I should say, is really an ultimate fact: the order of reproduction is the order of original occurrence, or the order in which they were originally attended to. We could learn the alphabet backward, but only by repeating it backwards as often as forwards. Next as to the simultaneous. This can be resolved into succession, seeing that to take in a complicated subject we must cross and recross the field of view until the parts cohere by being made to succeed each other in turn.

So far we are supposing the memory of one continuous and homogeneous scene—as a fixed row of houses, a strain of music, or a verbal sequence. When, to use Mr. Ward's language, we have portions of different continua—*e.g.*, sights and sounds—or non-adjacent parts of the same, the integration or association makes a new continuum or train, in which the two remote things are adjacent parts; in fact, are brought together from a distance, and rendered continuous. Here the movements of attention are particularly involved; to unite a house with a name we must attend mentally first to the one, and then to the other; and the influences that put attention in motion are then all-important. Interest is the main stimulus, but something may be done at first by mere intensity; the roar of a cannon and the flash at its mouth are doubtless associated by the mere intensity of the primary impressions. But the movements of attention, forming the connexion between one representation and another in the memory-train, are important as constituting "temporal signs," by which are meant marks of the order of

occurrence of images. They correspond to local signs in extended objects. We shall hear more of them afterwards.

Such being the " Memory-continuum," the next step is to form out of it an ideational continuum, or rather many such. The meaning is that the literality of the memory-train is broken in upon, except in idiots, by the collision of different trains, during which some parts are strengthened and others left to die out for want of the nourishment that renewal gives. Through this joint effect of obliviscence and reduplication we are provided with a flow (or many flows) of ideas distinct from the memory-train, and more or less suited for our intellectual and volitional manipulation.

The author then touches upon the interference due to conflict of presentations and mental currents ; objecting to the title ' obstructive association,' but admitting the fact. He next considers the moot point of drawing the line between Memory and Imagination, and is I think correct in assigning as the two characteristics of memory proper (1) concreteness or circumstantiality, and (2) localisation in the past, the last being the more essential. The representation of one's past self as agent or patient is also a concurring circumstance, but not essential.

From memory he proceeds to Expectation, as the natural sequel. After a series of events has been once experienced, we instinctively anticipate its recurrence, provided the memory-train is intact. At this point, however, the author widens the inquiry into an examination of the distinction of present, past and future. The present is the real or actual, and is determined by our primary presentations, as already seen. But we do not know the present as present until it is put side by side with both memories and expectations. An event expected has an interest altogether its own, and puts us into a more active attitude in consequence. The words ' expect,' ' await,' ' anticipate,' all point to an attitude of mind, wholly different from the attitude towards present or past. To know a present, as present, we must have, in the consciousness along with it, both memories and expectations, which are of course in the form of ideas or representations. The difference between memory and expectation is, as already said, a difference of attitude and interest : both are distinguishable from the present as being ideal. With a fixed series of events, ABCDE, we know where we are by one being in full actuality, as C, while AB and DE are in ideality ; and we know that AB are behind, when in moving on to D, the ideas of AB are fading, and the idea of E rising in intensity, while also engaging the expectation-attitude.

But how do we come by our knowledge of Succession and Duration, in all the fulness of their completed meaning? Past, present and future, as above figured, are in the consciousness simultaneously, and are distinguished only as real and ideal. Succession is, in fact, a mode of interpreting or stating a peculiar mixture of the co-existent: in the co-existent is a peculiar experience that we may call time-perspective; but even that is not first conceived as succession. For the development of this idea we must fall back on the so-called temporal signs, that is, the residual traces of the *movements of attention* in passing from one event to another in the series of presentations and their re-presentations. These signs are aided by the progressive variation in both intensity and distinctness as we pass along the perspective one way or the other. The variations by themselves would not suffice, as we might confound the faintness arising from what is remote with the faintness of a near but feeble original. The temporal signs, however, save us from this mistake.

As to our subjective estimate of Duration, there are various elements to be considered. When pleasure or pain are connected with occurrences, the estimate of duration is most delusive, and Mr. Ward enters minutely into the psychology of this effect, belonging as it does to the general theory of pleasure and pain; and I believe his explanation is both ingenious and just. The estimate of duration in things that are indifferent has been subjected to experiment with more or less definite results. It is doubtless a result of education to take the proper measure of the time occupied by an event; and our education has for its basis the standards provided by our artificial time-measures.

Equally subtle is the author's treatment of the question whether our notion of time remains discrete or becomes wholly continuous. The mind begins by hops or leaps, but at last seems to acquire the feeling or idea of continuity, with evanescent breaks, like the wheel of Savart, when its speed is increased to the pace of fusion of the separate beats.

In all that regards the ideas and feelings of succession and duration, the German writers have been more assiduous students than the English, and Mr. Ward has added his own modifications to the German results.

Before going on to the higher developments of intelligence, the author pauses to review the emotional and active constituents of mind in their more elementary phases. And first of "Feeling," that is, Pleasure and Pain.

Starting from the broad generalisation—as an account of

psychical or mental life—that receptive states lead through feeling to active states, and that presentations yielding neither pleasure nor pain meet with no responsive action, we are led to inquire whether the contrast of pleasure and pain has any corresponding contrast in the causes of feeling, on the one hand, and in the manifestations or effects on the other.

To begin with the causes. In the presentations themselves, or outward agencies of pleasure and pain respectively, we find no common characters; the peculiarities must therefore be in relation to the conscious subject. Now one prominent circumstance in relation is, that pleasure furthers life, and pain impedes or destroys it: the so-called law of Self-conservation. Mr. Ward admits that the law is conformable to facts, but rejects it as being too teleological for application. I doubt if he is right here. The teleology need not be introduced into the inquiry at all, while the law possesses the very condition that he insists on, namely, to assign a mark present in all pleasurable presentations and wanting in all painful. If self-conservation stops short of this condition, it is because no single principle will explain the whole of the phenomena. Indeed, any different principle must be continually liable to qualification according to the general state of vitality of the system; and, in point of fact, Mr. Ward is unable to exclude it in the exemplification of his own theory.

With a view to the inquiry, he gives a five-fold classification of Feelings. The first comprises the simple sensations and movements; the former more particularly. In these sensations, the pleasurable or painful effect varies with intensity, quality, frequency and duration. The leading fact is, however, intensity, into which quality may probably be resolved. With regard to movements, it is evident that pleasure depends solely upon intensity; a certain amount of exertion being always agreeable, and excess disagreeable. Of some of our sensations, as light and sound, the same can be said: they are always agreeable up to a certain point of intensity. When we pass to taste and smell, we encounter such cases as sweet and bitter tastes, which are pleasant or painful in all degrees. Mr. Ward would resolve these into hereditary associations with intensity. A bitter sensation may be the trace of organic pains originally accompanying a too violent stimulation of the taste, and a sweet the opposite. The hypothesis is admissible enough, but one would think it should have been preceded by a discussion of the organic pains and pleasures themselves. Instead of accepting as a

simple and ultimate fact the principle of intensity, Mr. Ward thinks it needful to explain the limitations of the pleasurable degree by two considerations. The one is that attention shall be forthcoming adequate to the intensity. I doubt if this can be called a better explanation than merely saying that the forces (nervous and other) are limited and liable to exhaustion, whence pain follows, which is the law of self-conservation over again. The other explanatory circumstance is that a pleasurable quality is one that enlarges the field of consciousness; in other words, connects itself with exuberant spirits, buoyancy and animation: which is to fall back again on the organic state, as conditioned by physical vigour.

The dependence of pleasure on duration and frequency is more easy to account for.

The second class of feelings comprises the combinations of simple sensations and movements, or the lower æsthetic feelings of harmony and discord. On these the author gives probably everything that can be advanced in our present knowledge.

The third class carries us into the region of intellect, and comprises the free or obstructed flow of ideas. These feelings are about the easiest of any to explain; yet in them too we cannot dispense with a reference to the economy of vital power. The fourth class takes in the higher æsthetic feelings, such as unity in variety, where the principle of economy is largely involved; likewise the wide-ranging associations of agreeable or disagreeable effects. There is no serious difficulty to surmount in this region.

The author's fifth and last class he terms feelings related to self, or the egoistic and altruistic feelings. These are the pleasures of self-complacency and self-satisfaction, and the pains of disappointment and failure. Instead of plunging into these complications, which need a much more elaborate handling, I could have wished him to discuss such leading emotions as fear, love, anger; these being obviously more elementary than what he dwells upon.

The general doctrine that there is pleasure according as a maximum of attention is effectively exercised, is ingeniously applied to the seemingly exceptional case of sleepiness. Here the field of consciousness is contracting, it is true, but then attention or activity is contracting still more, while the smallest attempt to arouse it brings on the acute pain of conflict. A much simpler explanation could be plausibly maintained.

The author faces another great and standing controversy

regarding pleasure, the contrast of the higher and the lower pleasures. He solves this psychologically, by urging that to advance to the level of life wherein greater pleasure on the whole is attainable, is a real rise from a lower to a higher state. This of course will not satisfy the parties to the ethical controversy, but it is not the less just from the point of view of pure psychology. The phrase for the difference is not ' dignity,' but economy or efficiency.

Great as are the subtleties connected with Feeling, greater remain in the nature and growth of the Will treated under the head of " Emotional and Conative Action ". I must here take into account the earlier treatment of Motor Presentations (p. 42), where the linking of action with feeling is considered. For an absolute commencement of the bond that unites feeling with purposive movements, we must set aside both reflex action and sensori-motor action, as being results of some prior arrangements more typical of the will itself. The real starting-point, our author thinks, is the wave of emotional diffusion ; the spontaneity of isolated movements he rejects as having no sufficient evidence, and as making movement precede feeling instead of following it, which he considers an absurdity. Without stopping to debate these positions, I must look at the author's attempt to define the primary emotional wave. He is aware that the diffusion arising under our developed emotions, such as anger, includes Darwin's ' serviceable associated habits,' and therefore grew out of will, instead of preceding it ; thus the combative attitude is a clear volitional after-growth. Darwin's third principle of emotional expression is the nearest approach to a primitive outburst—namely, certain actions that are the direct result of the constitution of the nervous system, under which he would include the movements expressive of joy and grief, which in some form or other are the simplest of conceivable states of emotion. Proceeding on this basis, Mr. Ward enumerates, as primitive movements of joy, dancing, clapping the hands and meaningless laughter; such actions not only belong to the pleasurable wave, but increase the pleasure. This is something. Again, on the side of pain, there is a variety of contorted and violent movements, in themselves painful, but operating to diminish the original pain more than they add to it, being, on the whole, soothing and salutary. But now, as regards our volitional progress, there is this great difference between the two opposite modes of feeling. The movements under pleasure are mere exuberance, or the overflow of good spirits, and are, so to speak, playful and purposeless. Pain, on the

contrary, forces on our attempts to escape the causes, and is the most urgent schoolmaster in our voluntary education. The author endeavours to minimise the counter tendency of pleasure to prompt to its own continuance and increase. That stage in the gratification of appetite, when pain has ceased and pleasure is pursued up to point of satiety, he would regard as a later growth or consequence of the primary urgency of pain. This refinement, however, may be carried too far. Granting that the removal of pain must always possess the highest degree of urgency, yet there are numerous cases where, starting from a state of pure neutrality, we enter upon a taste of positive pleasure, and follow it up till it ceases to become pleasure. But for the discipline of pains in the distance, which accompany all considerable pleasures, I am disposed to believe that the pursuit of pleasure, as such, would be no less genuine and unmistakable than the avoidance and removal of pain.

Out of the diffusive movements of feeling, and the fundamental law that connects the relief of pain and the increase of pleasure with accidentally coinciding movements, the growth of the will has to be explained. The difficulties of bringing about these happy chance-coincidences are formidable, and the time demanded is correspondingly great. Mr. Ward thinks that natural selection, and the survival of the fittest, would come in to accelerate the process. Be this as it may, the subjective selection must follow its course by bringing about an association between lucky movements and the state of feeling that they favour.

After Will comes Desire, with its various problems, which are fairly grappled with. What makes desire first to arise, what constitutes its urgency, and wherein lies the difference between represented pleasures that give their own satisfaction and those that stimulate pursuit for the reality—all these matters are soluble by manipulating the various elements concerned: the power of the representation; the activities of the moment, and the bearing of these on the end; the operation of habit in weakening the sense of pleasure, and increasing the tendencies to action. On the whole, the author contends that the activity involved in desire is a question of pain in some sort, and not the following of pleasure.

The higher forms of "Intellection" are now entered upon. The difficult question of controlled and regulated thinking is first to be considered. Then comes the vast instrumentality of Language, which Mr. Ward illustrates with great success. No less good is the discussion of general ideas, hitherto

given too exclusively under the alternatives of Nominalism and Realism. I have not space to advert to what is characteristic in this portion, nor to follow the author's examination of the developed categories of Unity, Difference, Identity, Likeness, which he thinks have been hitherto derived in a too easy-going and slovenly fashion. Causality he also discusses, and under it Belief. A section on "Presentation of Self, Self-consciousness and Conduct" closes the treatise.

I will add nothing to the running criticism already bestowed, in the course of setting forth the chief positions, except to advert in a few words to the peculiar stress everywhere laid on Attention. The immense compass assigned to the word is somewhat discomposing. At a very early stage we are told that Attention is to cover what is commonly meant by *inattention*. When Daniel O'Connell was at the height of his repeal-agitation, he was warned by Sydney Smith that he might have to reason the point with that armed Aristotle, the Duke of Wellington. So we can imagine the response to this view of Attention by the commander-in-chief of the British Army, whose central word of discipline is thus tampered with. I make the fullest allowance for the need of a general word to express the reaction of the Subject upon presentations, &c., yet I doubt if the sum total of the influences that intensify impressions and promote their retention should be comprised under the one word "Attention". A still more general designation, such as 'mental *tension*' or 'conscious *intensity*,' would be desirable; while 'attention' could be reserved for special modes of intensification.

The operation of exercising control over the mental trains presents one of the most difficult of our psychological analyses. It has been discussed with very great acumen by Mr. Bradley in the last number of MIND; and I think his conclusions on the whole remarkably just. On the question, whether, in our voluntary control of the thoughts, there is always a muscular intervention (in an ideal transmutation), Mr. Bradley unintentionally misrepresents my published views on the point (see in particular, *The Emotions and the Will*, 3rd edit., p. 372). I do not regard muscular intervention as operative in all cases, and have expressly referred to the instance of attending to one instrument in an orchestra as demanding some other medium of selection. I will not here endeavour to classify all the forms of the intensifying influence, but will advert to one real distinction lying at the very root of our voluntary power. I mean the difference

between immediate and mediate interest; between the pleasure (or relief from pain) involved in the act itself, and the prospective pleasure or relief operating as a motive. The first is the voluntary impulse in its purest, most primitive and perennial aspect; to hug a pleasant idea is as purely instinctive and untaught as anything can be; the higher apparatus of the will—as expressed by resolution, deliberation, purpose—has no part in it. Now, we may undoubtedly apply the word 'attention' to this instinctive mode; but the process is more usually described by such words as 'attraction,' 'arrest,' 'fascination,' 'irresistible charm,' and so forth. It is in the second class of impulses, where a prospective motive is at work, that the word attention is most characteristically employed: the case of a thing that has no charms in itself, and where we are induced to dwell upon it by some extraneous or remote consideration. Such is 'Attention' in the school and in the army. As to the use that Mr. Ward makes of Attention in his theory of pleasure and pain, a much more lengthened consideration would be necessary than I can give to it here.

There is another point to consider before we bring forward a change in scientific nomenclature. We ought first to show that it is wanted, and next, take the measure of our own influence or persuasive power for getting it adopted. A multitude of conflicting renderings of well-known facts is an evil, although, it may be, a necessary evil. As regards the formidable enlargement of the sphere of meaning to be given to the word Attention, we certainly desiderate more reasons for the change than, as far as I am aware, have been as yet supplied.

Nevertheless, to speak of the paper as a whole, the author's handling of the topics he has overtaken will reward the most careful study. There is force in everything that he advances; and, for my own part, I have been always instructed, and often convinced, by the arguments in favour of his positions, whether new or old. The form of the treatise, as it now stands in the *Encyclopædia*, has obvious disadvantages. When the matters excluded by the narrow limits are filled in, when the illustration of the whole is duly expanded, and when, finally, the exposition of subtleties is transferred from *brevier* to *pica*, Mr. Ward will have produced a work entitled to a place among the masterpieces of the philosophy of the human mind.

II.—ILLUSORY PSYCHOLOGY.

By SHADWORTH H. HODGSON.

ENGLISH Psychology and English Philosophy are both very good things, so long as they cleave to experience as their only basis and their only test. The endeavour to do so is usually and justly claimed as the characteristic mark of English thought; and whenever a signal success in it is obtained, which by no means follows as a matter of course, then it is that our psychologists and philosophers always feel the most legitimate satisfaction.

If ever there was a time at which it was necessary to hold fast this endeavour of cleaving to experience alone, under the pressure of seductive phrases, and the familiar use of ambiguous terms which cover tacit but unwarranted assumptions, that time is the present, a time of renewed vigour indeed, but nevertheless chaotic, and fermenting with the elements of speculative systems as yet unorganised or at any rate unrecognised. Whatever speculations are put forward at such a period by competent writers, whether in psychology or in philosophy, as being based on experience alone, and belonging to the English experiential line of thought, deserve the most respectful attention and scrutiny. Even results which are *prima facie* paradoxical should not on that account be passed over as unimportant. If for instance we are told by a competent writer, that Absolute Idealism is not only a truth of experience but one attained directly by the method of experiential psychology, we should not allow our astonishment to prevent our examining the arguments, by virtue of which English psychology attains the results of German transcendentalism without quitting the ground of experience. Experience is notoriously fruitful of surprises. And when the post of honour in two successive numbers of MIND has been conceded to the exponent of the result in question, it is high time that some one should endeavour, however humbly, to test its validity.

I refer to Mr. J. Dewey's articles, "The Psychological Standpoint" in MIND 41, and "Psychology as Philosophic Method" in MIND 42. I will deal with these very briefly, taking them in order as they stand, but without recapitulating their whole contents, which, in the case of articles so recent, would be unnecessary, seeing that they will doubtless

be fresh in the memory of all readers of this Journal; and first the article in MIND 41, "The Psychological Standpoint".

I.

We are told at the outset that "the nature of all objects of philosophical inquiry is to be fixed by finding out what experience says about them" (p. 2). Nothing can be more true. But then immediately follows, "And psychology is the scientific and systematic account of this experience". That I for one deny. But assuming it for the present *argumenti gratiâ*, let us see how the inquiry proceeds. The result reached or to be reached by this method is named by the writer himself Absolute Idealism (p. 12). And the conception, which is supposed to enable us to reach that conclusion from the broad basis of experience, is the conception or truly conceived fact of a real identity between the individual and the universal consciousness, or the individual and the universal self (pp. 10, 17, 18, 19).

In the first place I remark that it is inconsistent with the claim of standing on experience alone to speak of "the postulate of an universal consciousness" (p. 15). If the existence of an universal consciousness is an indisputable fact of experience, it is a fact and not a postulate. If it is disputable, it can at most be an hypothesis, and then the grounds for assuming it must be alleged. With Mr. Dewey it is (pp. 18, 19) a presupposition essential to English philosophy and English psychology; which circumstance is alone sufficient to destroy the claim which he makes for them of appealing to experience alone.

That this really is Mr. Dewey's conception is plain from the first sentences of the following passage, in the latter part of which he develops his idea of the required identity between the individual and the universal consciousness:

"English philosophy can assume its rightful position only when it has become fully aware of its own presuppositions; only when it has become conscious of that which constitutes its essential characteristic. It must see that the psychological standpoint is necessarily an universal standpoint and consciousness necessarily the only absolute, before it can go on to develop the nature of consciousness and experience. It must see that the individual consciousness, the consciousness which is but 'transition,' but a process of becoming, which, in its primary aspect, has to be defined by way of 'contrast,' which is but a 'part' of conscious experience, nevertheless is, when viewed in its finality, in a perfectly concrete way, the universal consciousness, the consciousness which has never become and which *is* the totality; and that it is only because the individual consciousness is, in its ultimate reality, the universal consciousness that it affords any basis whatever for philosophy" (p. 18).

I confess I am utterly at a loss to see either how Mr.

Dewey justifies on experiential grounds the existence of an universal consciousness, or in what he imagines the relation between the individual consciousness and the universal one to consist. He tells us at p. 17 " that consciousness is the unity of the individual and the universal," and also that " since consciousness does show the origin of individual and universal consciousness *within itself*, consciousness is therefore both universal and individual ". But he prudently postpones the question of *how* this is to a future opportunity. The obvious reason here is, that he does not know. For if he had known this, he could not possibly have given the account of the relation between them which he has given, meagre and vague as that account is ; nor could he possibly have maintained that the existence of an universal consciousness is a matter of fact bound up with conscious experience. He falls into the common and perhaps even favourite fallacy of first generalising his own consciousness and making an *ens logicum* of it, and then reconverting it into a really existent consciousness with the attribute of omniscience. He imagines his own general conception of consciousness realised in an individual case adequate to the generality of the conception, that is, an indefinitely great consciousness, which he calls the universal consciousness or self.

It will fairly be expected that I should show how this logical and generalising process takes place without really transcending the individual consciousness generalised. This will not be difficult. The process is extremely simple, though it cannot be said to be commonly understood. Conscious experience comes to an individual, any individual, whom we will call A, in a varied stream of states and changes, sensations, emotions, thoughts, feelings, desires, volitions, and so on, out of which the world of every day or ordinary experience, as it is called, is gradually built up, and which embraces *everything*, without exception, of which the individual can think, or to which he can even so much as advert in thought. Prior to this stream, or beyond this stream, there is nothing, no possibility of assuming either its individuality or its universality, or distinguishing these two conceptions from each other, or even of distinguishing Subject from Object. The universality of the stream in *this* sense, meaning its property of being all-embracing, Mr. Dewey has well seen and insisted on.

But secondly, note this further circumstance. The stream of consciousness as it comes to A is, as a matter of fact, a fact which we learn from itself on examination of it, an individualised stream, and occurs in *perceptual* order. Exactly

as it occurs to A it occurs to no one else; exactly as it occurs to A once it never occurs to A twice. It is an absolutely unique stream of events, or of states and changes, in A's consciousness, constituting A's experience. It is experience as given, the *data* out of which what is called ordinary experience is built up. It is an unique stream, and it is a stream of *data* as *immediately perceived*.

Thirdly, advert to another point, and here we reach the turning-point of the explanation. A is not merely a perceiving, but also a thinking creature. *Pari passu*, or rather throughout interwoven, with this stream of percepts in A's experience, and as part of the condition enabling its transformation into the experience of ordinary life, that is, of seeing and dealing with men and things, there goes on a comparing, contrasting, classifying process among, between, with, or upon the data. Every act of attention to a percept is the commencement of a generalisation, a commencement which needs only the occurrence of similar percepts, or the knowledge that such are possible, to become *ipso facto* a generalisation of the original percept, which then assumes a representative, that is, a general character. Attention first abstracts, or picks it out, from its original context; involuntary experience does the rest; and a general thought, a conception of the re-active mind made pregnant by perception (the phrase *concipere animo* being analogous to the phrase *concipere utero*), a concept inclusive of possible future experience, is the result. Generalisation supervenes unconsciously and completes unawares the conscious and volitional act of attention, with which thought begins.

But now suppose, in the first place, that this thought is directed, not to build up a world of men and things out of the data, but to the contemplation of the data themselves, of experience simply as experience. How are the results embodied, and in what shape do they appear? They are embodied, not indeed in natural objects, but still always in general conceptions, expressed by general terms, and are no longer either pure percepts or in a purely perceptual order. They are grouped, classified, and sub-classified, but appear always henceforward in general, not individual shape. There is loss as well as gain in this. No form of conceptual thought or of language is ever adequate to represent an individual percept or complex of percepts; they are represented and expressed, more or less nearly, by limiting one general term by another, as for instance a particular shade of blue is *perceived* by consciousness *immediately* as that particular shade, but is *thought* by consciousness *mediately* as

blue generally, limited and defined by *light* or by *dark*, that is, by means of conscious comparison with other perceptions.

And what is true of the data of perception in the stream of consciousness is true also of the things of nature, the objects of ordinary experience. The properties or attributes of a natural object, a piece of wood for instance, are combined with one another in an intimate union which is *perceivable* or *imaginable;* the hardness, the dryness, the moisture, the woody fibre, the pores, the grain, the colour markings and so on, are conjoined one with another in a way quite different from that which they take when enumerated and superposed one upon another in thought, as we have now been doing in *conceiving* and describing them. The attributes of a natural object as a *percept* have quite a different order and arrangement from what they have in the same object as a *concept.* Thus the order of real existence also is an order of perception and imagination, just as much as the stream of data is; and this order is in both cases converted by conception or thought into a pile of generalisations artificially combined for purposes of investigation. In other words, the perceptual order of nature and of experience is modified and moulded by thought into a conceptual order and arrangement. We cannot think save by general determinations of perception, nor speak save by general words expressing them. It is thinking which first introduces these into the stream of consciousness, which draws the first distinction between general and individual, and which thereby enables us to see the fact that perception is always of the latter, though without always knowing it to be so. Even the term *individual* is a general term. When we say *this* individual, that is merely a case of *digito monstrare*, as if in utter desperation of *expressing* him as an individual reality.

Lastly be it noted, that this conceptualising or generalising process is a generalisation of consciousness, of conscious experience, itself. As of the parts, so also of the whole. No single general term, no complex of general terms mutually limiting and modifying each other, ever attains adequacy to the individual thing, person, feeling, or state of consciousness, to which it is applied. There is always a *margin*, so to speak, in the conceptual or general term, which does *not* fit close to the intended individual, and which therefore may possibly apply as well to another individual, if any there be, similar to the former. We naturally and necessarily generalise our own consciousness in actual experience, and we never transcend our own individual consciousness, I mean of course the stream of data which is ours alone, in doing so. This would be an impossibility. That each of us is an individual con-

sciousness is not the consequence of any assumption which we have power to make or abstain from making. It is done for us by nature, and we find it out when we reflect on our consciousness philosophically.

Mr. Dewey seems to think that, by refraining at the outset of psychology from assuming that we are individuals, the possibility is opened of our being the universal consciousness (p. 8 at top). He seems also to think that, because consciousness is *one* in point of *kind*, therefore the individual and the universal consciousness cannot be *two* in point of *number* (p. 17 at top)—a short cut indeed to the Deification of the individual. Now there are many assumptions which we have to use care, often anxious care, and take much trouble and acquire painful instruction in order to avoid. But our own individuality is not one of them. We cannot transcend our own consciousness, however much we may generalise it. Generalising it alone, therefore, can never land us in the belief, still less in the knowledge, of an universal consciousness different in any respect from our own. Its generalisation is merely another way, the logical or conceptual way, of representing its individuality, of what in actual experience is perceptual.

Our belief or our knowledge of the existence of other conscious beings besides ourselves is always drawn from something else over and above the mere generalisation. We always have positive grounds, real or fallacious, for filling up the margin, above spoken of, with similar instances. The general term *man*, for instance, has a wide margin which admits of many varieties, and many real men, being included under the term. This whole group of real men I would call its logical *comprehension*, though I believe there is not complete agreement among logicians as to the nomenclature. There are positive grounds, all drawn ultimately from A's own consciousness, for A's belief in the existence of real men besides himself. But what are A's grounds for belief in the existence of an universal conscious being other than A himself? This is what we would gladly learn from Mr. Dewey; but Mr. Dewey contents himself with replying that it follows from the "presupposition of English Psychology". It were to be wished that some other basis than a "presupposition of English Psychology" should be found for Mr. Dewey's conclusion, that "the individual self" "has its origin in processes which exist for the universal self, and that therefore the universal self never has become" (p. 19); or, as we find it stated at another place, after replying to the theory of Reasoned Realism, "the solution is that the con-

sciousness to which all existence is relative is not our consciousness, and that our consciousness is itself relative to consciousness in general" (p. 10).

I must not omit to remark, that Mr. Dewey's own statements on this point are in contradiction with each other; that according to him the individual consciousness now is, and now is not, identical with the universal. But as he is quite aware of this (p. 16), yet without considering it a conclusive objection, to insist upon it would be fruitless. To assume provisionally that two differently named things are different is no hindrance to proving afterwards that in some essential respects they are identical. But to begin by assuming them identical, in hopes of showing the *how* afterwards (p. 17), is fatal to proving *that* they are so, because, under cover of assuming their identity only, it tacitly assumes what it has to prove, the existence of both as realities. Not even the august companionship of German transcendentalism could redeem such reasoning from logical perdition.

It seems to have been the general term *consciousness* which has played havoc with Mr. Dewey's ideas. When he uses such phrases as a consciousness which is not ours, and to which all existence is relative, or speaks of an universal self or consciousness, or of an individual self or consciousness, he plainly implies more than consciousness in general or consciousness simply. He implies some conscious beings or agents in whom consciousness is seated. Consciousness in general and consciousness simply are terms which imply nothing at all with regard to the seat, or agent, or agency, connected with the consciousness. The consciousness is taken, when these terms are used alone, as a mere *content*, the content of the stream of consciousness as data of experience. All further distinctions and conceptions must be derived from this stream of data, from consciousness in general or consciousness simply. As Mr. Dewey well puts it, they must be found "*within consciousness*" (p. 17), or again, in developing what he well calls "the nature of consciousness" (p. 14).

But to abstract from the seat, or agent, or agency, of consciousness, as we do by using the terms consciousness simply or consciousness in general, is not to assert that they have no seat, agent, or agency, connected with them; nor yet is it to affirm that the seat, agent, or agency, is individual; nor yet again that it is universal; all this must come afterwards, that is, by examination of the nature or content of consciousness. But Mr. Dewey tells us, in a passage already quoted, that English Philosophy must see that "conscious-

ness is necessarily the only absolute before it can go on to develop the nature of consciousness and of experience. It must see that the individual consciousness . . . . is the universal consciousness, the consciousness which has never become, and which *is* the totality" (p. 18). This put briefly is neither more nor less than identifying man as a conscious being with God as a conscious being, on the sole ground that man's consciousness contains all the evidence he ever has for knowing anything at all. It is true that man partakes of consciousness in general, but it is false to identify consciousness in general with universal consciousness.

Nor can the view which I am now maintaining be fairly characterised as Subjective Idealism. This name would be applicable to it only in case it could be shown (as it never can) to involve and inevitably carry with it the further doctrine, that the *real existence* of the things known in any individual's consciousness depends on the existence of his consciousness, as confessedly their having a *meaning for him* depends upon it. The real existence of anything depends upon its having real conditions, and these form a system and a series of real existents and real events stretching back indefinitely, perhaps infinitely, into the past. But nothing warrants the inference that, because the individual can know of these conditions only through his present consciousness, he must therefore either have existed as a conscious being through all that period, or must now be creating and endowing them with past reality in his imagination. Still less, if possible, is the inference warranted, that a consciousness *not* the individual's was a necessary part of those real conditions. I mean that, if it be so, as it well may, the fact must be proved or rendered probable by some positive and independent evidence. It does not follow simply from the fact that existence is *knowable*, or has a *meaning*, in consciousness only. There is nothing in consciousness, taking the term simply, to show that it is the real condition of anything whatever, still less that it is *Causa Sui*, or, in Mr. Dewey's phrase, "the only absolute".

Once more, when we speak of consciousness as embracing all knowledge, we are necessarily and *eo ipso* abstracting from it as the *bearer* or Subject of knowledge; and therefore it is a logical fallacy, a contradiction to our own procedure, to speak of consciousness as an universal *knower* on the ground of its being universal *knowledge*. Now Mr. Dewey objects to the presupposition that consciousness has an individual bearer (p. 3), but insists on the pre-supposition that it has an universal one (p. 18). I mean of course that he supposes this

latter pre-supposition to be positively enjoined, instead of being, as it is, positively forbidden, by the fundamental truth, which he rightly and firmly holds, that consciousness simply is all-embracing. Both presuppositions are illogical as presuppositions; but then the former, on grounds of experience alone, is demonstrably true of man, while it is in the highest degree problematical whether the latter is true, or even thinkable, in any application whatever, seeing that an universal self can only be represented in thought as an individual self indefinitely, or perhaps infinitely, magnified.

Mr. Dewey stands by no means alone in holding the views he does. He belongs to a large and probably increasing number, who seem to think that philosophy has only two alternatives to choose from, Empiricism and Transcendentalism. The possibility of a strictly *experiential* philosophy, which is neither the one nor the other, does not seem to have occurred to them. Perhaps, for the present, a *prudens quæstio* is the best way of enlightening them on this possibility. When a Germanising enthusiast tells you, as a primary and self-evident truth, that the whole being of the phenomenal world depends on consciousness, instead of arguing the point, ask simply—on *whose?* This will compel him to take one of three courses, maintaining either (1) that consciousness can exist independently of a conscious being, so that no "whose" is requisite, a proposition for which there is no evidence, or (2) that the being who has the consciousness in question is other than himself, the speaker, the evidence for which can never be immediate, or (3) that he himself is the author of the world, an opinion which consistently held would quickly lodge him in an asylum. These alternatives will probably bring to light a confusion in his mind between the fact, which is true, that the *meaning* of the world depends on consciousness, and the opinion, which may be false, that the *real existence* of the world depends on it. Both statements are covered by using the large and unanalysed term *being;* and the truth of the former by no means carries with it the truth of the latter, as an immediate consequence or necessary implication. He has in fact been making an unwarranted assumption, which by a strictly experiential method he would have avoided.

II.

I pass now to the second of Mr. Dewey's two articles, "Psychology as Philosophic Method," in MIND 42. Here will be the place to justify my previous refusal to call the science which Mr. Dewey has in view, in both his articles, *Psychology*,

the term having been so far accepted *argumenti gratiâ* only. Not that my objections will be limited to the question of nomenclature, although even this will involve some consideration of the true relations between philosophy and psychology. They will be directed also to establish that, so far from psychology being shown to be philosophic method, no method at all, psychological or other, is here exhibited. What we have here is merely a reiteration of the sort of results to be expected from pursuing that kind of psychology which Mr. Dewey advocates.

Mr. Dewey begins by identifying the "English development in philosophy" with "the psychological movement since Locke," and of this he tells us, that it is "the ultimate science of reality, because it declares what experience in its totality is; it fixes the worth and meaning of its various elements by showing their development and place within the whole. It is, in short, *philosophic method*" (p. 153). His thesis, then, is briefly this, that psychology is the method of philosophy.

I shall pass over his criticisms of his German or rather Germanising friends of the "transcendental" movement, with the results of which, he tells us, his "method" is in substantial agreement (p. 154); merely remarking that, except perhaps in the political field, I can imagine no more glaring instance of surrendering principles in fact, while still professing them in name, than this surrender of the principles of the experiential to those of the transcendental or *à priori* school. Let Mr. Dewey go over and welcome! to the transcendentalist camp, let him go by all means if he is convinced that truth is on that side; but let him not profess while he does so, that experiential principles carry him over, that he goes in obedience to that "experience" which has always been the distinction of the English school. Let him frankly own that he does so in deference to presuppositions which are *à priori* to experience. We have seen that the fact is so, in the former part of this paper.

No alliance or compromise is possible in philosophy between the two principles of appealing to experience alone and appealing to experience *plus* presuppositions. Now Psychology in the true, and I think also the usual, sense of the word, which is not Mr. Dewey's, is really built upon experience *plus* pre-suppositions, and a true Psychology upon true presuppositions, just as all the other positive and experiential sciences are. This is no derogation from their dignity, nor any impeachment of their validity. There is but one science which is built on experience alone pure and simple,

and that science is analytic philosophy or Metaphysic, or in other words the analysis of that stream of consciousness which contains the *data* of experience, as set forth in the former part of the present paper. But Mr. Dewey will have it, that psychology and philosophy are identical, that there is no philosophy but psychology, or, in his own words, that psychology is *philosophic method*. This *à priori* resolution of his, this Mezentian marriage which he is bent on celebrating, compels him to subordinate the experience of philosophy to the presuppositions of psychology, while still professing to appeal to experience, as a genuine disciple of the English School. True, it is only his logic that is at fault, but then logic is a large *only*.

If English Psychology in Mr. Dewey's sense, in which, as he tells us, it is substantially identified with German Transcendental Philosophy, is to begin with the ideas which Mr. Dewey endeavoured to show in his first article were necessarily involved in its necessary presupposition, it is hardly fair in him to his English readers to call it psychology simply. He ought in simple fairness to have named it psychology human *and divine*. It cannot be "in substantial identity with the presuppositions and results of the 'transcendental' movement" (p. 154), and be psychology in the usually accepted sense too. No psychologist, I venture to say, in this country considers himself to be busied with the psychology of the Universal Self, or to be trespassing on ground covered by the theological doctrine of the SS. Trinity. German Transcendentalism no doubt embraces all this ground, but English Psychology, unless surrendered to Transcendentalism, does not. And, as Mr Dewey frankly admits, transcendentalism itself entirely repudiates the claim of psychology to be anything more than one of the special sciences (p. 154). In short it rejects the proffered morsel.

Supposing however, with Mr. Dewey, that psychology, notwithstanding its substantial identity with transcendentalism, still retains a definite nature and character of its own, a question occurs which, I suspect, will prove not a little embarrassing. The question is this. If psychology is philosophic method, *which* psychology is the one intended? Is it physiological psychology, or is it the psychology of an immaterial Psyche? I content myself with naming the two main antagonistic directions taken by psychologists, without specifying the various subdivisions, or combinations of subdivisions, into which they fall. It is clear that, before psychology can pretend to be the method of philosophy, it must have made up its mind what its own mode of pro-

ceeding as psychology is. To take its method from philosophy would be to contradict the very claim advanced.

Another point. If psychological science is identified with philosophy as its method, and the name *psychology* is transferred to it with that signification, what name is to be given to that positive and special science, which takes its stand upon the results of physiology or biology, and studies the phenomena of sentience and consciousness in connexion with their proximate conditions in individual living organisms? Mr. Dewey will not, I imagine, deny that this is a genuine and fruitful department of positive science, or that it has several close connexions with allied or subordinate branches. Now this branch of positive and special science, which I do not profess to have described fully, but have perhaps described sufficiently to designate the science intended without ambiguity, is now known as *psychology*. But if this name is to be transferred to the method of transcendental philosophising, not only must this positive science look about for a new name for itself, but also the whole nomenclature of its allied and subordinate sciences will be thrown into confusion; I mean such sciences as comparative psychology, race-psychology, psychophysic and the like; unless indeed they too, with probably biology, physics, chemistry, and even (who can say?) kinetics, statics, and kinematics, or even (what is to hinder?) geometry, arithmetic, and the calculus, are to be handed over to a free *à priori* treatment, based on the presuppositions of transcendentalism. At any rate psychology itself (I mean that science which now bears the name) would inevitably suffer from the confusion wrought by the proposed transfer.

Psychology as it now stands, and named by the name it now bears, is entirely in harmony with all the old landmarks of thought, and its position with the position of the other sciences. However important may be the points on which different psychological schools are at variance,—and that they are extremely important is evident from the nature of the two main directions just mentioned, which may be respectively named materialist and immaterialist,—they all agree in the main point of the position and purpose of the science itself. It is to examine the laws of the origin and development of sentience and of consciousness, in all their modes and operations, in connexion with their proximate real conditions, in the individual, whether the conditions or the individuals be of a material or of an immaterial nature. Whatever may be the nature of the agent indicated by the first part of the name of the science, whatever may be the

nature of the *Psyche*, it is always as an individual agency that it is studied, and always as either containing or actuating the proximate real conditions of the states and changes of states of consciousness in an individual being.

Now it is true, and this fact it is which seems, if I may venture to say so, chiefly to have misled Mr. Dewey, that the series of states and changes of an individual's conscious ness is all-embracing; contains, either as data or as results, his whole knowledge. And what is true of one is true of all alike, and of all as individuals. Nor do we positively know of any consciousness which is not an individual's. In studying psychology, therefore, even individual psychology, we seem to have before us the whole content of consciousness to study. And what is more, we have to study it in its entire historical concatenation and genesis, the whole picture which an individual forms of the universe, and the steps by which, during his life and experience, he arrives at completing it. *Primâ facie* it seems obvious, that the study of an object so comprehensive as this can be nothing else than *philosophy*.

But this *primâ facie* view of the case, tempting though it be, is nevertheless not the true one, and for this reason. A point has been silently dropped out of notice in taking it. This is, that the whole picture, in its entire historical concatenation and genesis, is studied only *sub conditione*, subject to a restriction, namely, *in its connexion with the individual agent as its proximate real condition*. This individual agent has first to be distinguished, as an individual agent and real condition of consciousness, from and out of the entire picture of the universe, drawn either by himself or others, but always taken as a picture simply, or rather as a content of consciousness, abstracting from any particular portion or portions of it which may come to be regarded as real conditions of the rest.

An individual is conscious, let us say, from his birth onwards, but he cannot psychologise, however rudely, until he has first, however rudely, philosophised. I mean that he must first distinguish different parts of the content of his consciousness from one another, must perceive them as *differents* simply, before he can distinguish one part as *the condition* of another. The perception or the thought, that one percept or complex of percepts is related to another as condition to conditionate, presupposes that those percepts have been already perceived as different from each other, for this is requisite to the conception of a condition being formed at all. The perception of self having feelings, and the perception of objects giving rise to feelings in self, are cases under this general rule. Now psychology

is occupied with the proximate real conditions of consciousness; and the knowledge of these has to be derived from the content of consciousness simply. Consequently you cannot put psychology into the place of philosophy without subordinating questions of pure analysis to questions of genesis; and you cannot do the latter without, inadvertently indeed but none the less surely, reversing or confusing the true and only real order of knowledge, as it is founded in nature, and manifested in the process of consciousness, which is the process of experience.

Similarly the question whether consciousness is individual or universal presupposes that the meaning of these two terms has been at least roughly ascertained. It can be ascertained only by an examination of the content of consciousness simply, that is, by perception of differences, perception of samenesses, classification and grouping. The same is true of every general term which language contains. It follows that, since nothing but a content of consciousness simply is the logical and historical foundation or datum of knowledge, the sole ultimate test of the correctness of knowledge is *analysis* of the content, and not a presupposition either about its nature as individual or universal, or about its source or real condition as depending either on an individual or on an universal being.

Now this analysis of consciousness as a content simply is, what nothing else is, an appeal to experience and experience alone, in the strictest sense of the term. And this circumstance distinguishes it sharply from every other branch of intellectual work. Every other branch of knowledge has presuppositions derived from this branch, has a portion of the field of labour marked out for it by reference to distinctions which are established by analysis simply. In this respect the analytical branch stands to the rest in the relation of whole to parts. Just as the content of any individual's consciousness, taken simply as content, is all-embracing, in the sense of all objects being within its purview, so this subjectively analytic branch of knowledge embraces in its purview all the other branches of knowledge, in the sense that it knows in what part of its own field they have their points of origin and departure. Psychology has its point of origin and departure in the conception of the real condition or conditions first originating and then governing the course of consciousness in a real being. It follows that psychology can only then be based on experience alone, when its presuppositions are derived from metaphysic. Presuppositions it must have; and metaphysic is the only means of securing for these an experiential basis.

It cannot be denied that there is such a branch of intellectual work as I have sketched, distinguished sharply from all other branches (1) by its being analytic of experience, as such, and without any presuppositions or assumptions, (2) by its giving an account of the presuppositions of all the other branches, and of their points of departure from its own universal content. Its existence is a logical necessity. But how soon it will be recognised, how soon it will begin to be generally cultivated, or cultivated under its proper and specific name *Metaphysic*, is another thing. In this country the name *metaphysic* is usually reserved for speculations like those of Mr. Dewey. We are slow to recognise in the analysis of experience without assumptions Aristotle's science of Being *quâ* Being. Nevertheless that is the plain truth. If we want *to know* what Being *is*, we must ask what *it is known as*. The words are almost a tautology. It follows that, if you can discover anything which belongs universally to the *whole* of consciousness as a generalised content, you have found something which is a predicate of the *whole* of Being as a generalised content; for Being is the object known in consciousness. And this is a very different thing from any mere Theory of Cognition, as the Germans call it, which, from ignoring the distinction of experience between the content of consciousness and the agent, or agency, supporting consciousness, leaves consciousness and Being standing severally and apart, over against each other,—*cogitatio cogitantis* on one side, and *res existentes* on the other,—which like two clocks require, in theory, some third thing to harmonise them, so giving rise to absolutist and transcendental hypotheses, which never can be verified in experience.

The content of consciousness simply as content is the object-matter of metaphysic. Each individual examines the content of his own consciousness, but simply as content, that is, abstracting from the question of its genesis and history in himself, which he leaves to psychology. The content taken in this abstraction is not many but one; the individuals in whom each content originates, its *termini* so to speak, are many; but the content is *one*, common to all the individuals, that is, it is the Universe as known or knowable. Psychology is not the science of the universe, but of the soul, that is, of the individuals in relation to consciousness. Metaphysic is the science of the universe, the common content of all individual consciousnesses. In metaphysic we have to harmonise what we know ourselves with what we know that others know. In psychology we search for the conditions which govern the nature and order of our own

states of consciousness as peculiar to ourselves, the connexion between them and their conditions being the thing sought. In metaphysic, though we cannot unbind ourselves from the *fact* that our consciousness is individually conditioned, yet we can abstract from it so as to avoid making it the object of inquiry. But we cannot abstract from it in psychology, for the plain reason that it is the special fact which psychology has to study. Of course I do not for a moment deny that psychology is of the utmost service to metaphysic, and exercises a most important and even necessary control over its analyses, for which reason the two should never be sundered, and certainly not in the interests of metaphysic, supposing always that psychology is properly constituted on the basis above described. And the same may be said of all the positive sciences in varying degrees. Metaphysic is at once their basis, and its content their generalised counterpart or subjective aspect, which must be harmonised with, and partly by means of, their results. Nevertheless the logical *principia* of psychology and metaphysic are different, as well as their purposes and methods. They are not distinguished by one being the science of the individual soul, the other of the universal soul, but by one being the science of the real conditions of consciousness wherever found, the other the analysis and classification of its content.

But it is time to bring this paper to a close by asking the final question, What does Mr. Dewey mean by method? If psychology is the method of philosophy, what is the method of psychology? A method we naturally expect to be some principle or rule which guides our procedure in investigating. What, if any, are the principles or rules proposed by Mr. Dewey as special to psychology? There are literally none. There are plenty of passages which speak of *what* psychology is to do, but very few of *how* it is to do it. One remarkable passage indeed there is, in which it is said that "Psychology is the completed method of philosophy, because in it science and philosophy, fact and reason, are one" (p. 165). But if psychology is only the *completed* method of philosophy, it looks as if the method while at work, and before completion, belonged rather to philosophy than to science.

The passage which comes nearest to a description of the method of psychology is the following:—

> "But the very essence of psychology as method is that it treats of experience in its absolute totality, not setting up some one aspect of it to account for the whole, as, for example, our physical evolutionists do, nor yet attempting to determine its nature from something outside and beyond itself, as, for example, our so-called empirical psychologists have done" (p. 168).

The method is here described by negatives only. It consists in the precepts to avoid the faults exemplified by the physical evolutionists on the one hand and the empirical psychologists on the other. But as to any positive direction how to go to work in investigation, there is a blank. This is quite what we should expect from the identification of psychology with transcendental philosophy.

The reproach of being wanting in a positive method by no means attaches to philosophy when philosophy is taken in its true sense. There is a very definite method in Metaphysic as I have sketched it above. Besides the characteristics already named of being subjective, analytic and avoiding presuppositions, its method consists in taking the distinction between *nature* and *genesis* as its guide, and using it so as always to subordinate the question of genesis to the question of nature. It always asks first the question, *What is this thing known as*, before proceeding to the questions, *how it comes* and *how it behaves*, or *what it does*. Positive science proceeds by way of definition, hypothesis and verification. Metaphysic, the business of which is to get a true picture of things, a content of consciousness at once complete and self-accordant in all its parts, proceeds by way of analysis guided by the above distinction, in order to avoid, or at any rate to eliminate, assumptions unwarranted by experience.

In conclusion I would remark that the fundamental fallacy of Transcendentalism as well as of Empiricism, when this latter sets up for philosophy, consists in a violation of what I hope I have made evident is the fundamental principle of true, that is, metaphysical philosophy. This principle is, that the all-embracing character of consciousness (which is that feature in it which enables it to be the basis of philosophy), is true as fact only when understood of the *nature* or *content* of consciousness, abstracting from its agent or bearer, the conscious being, whether this being is conceived as an universal or as an individual being. English thought, when it does not adopt this distinction, and I need hardly say that it most commonly ignores it altogether, usually inclines to the individual hypothesis,—I mean to identify consciousness with an individual being. By so doing it retains validity only as scientific psychology and cuts philosophy entirely adrift. Transcendentalism, which also ignores it, inclines on the other hand to the universal hypothesis, that is, identifies consciousness with an universal being. Thereby it retains validity neither as philosophy nor yet as scientific psychology. By one stroke it substitutes psychology for philosophy and makes its psychology illusory.

III.—HEGEL'S CONCEPTION OF NATURE.[1]

By S. Alexander.

Hegel's Philosophy of Nature forms the second part of his great *Encyclopædia*, lying between the science of Logic and the science of the Spirit. In nature, according to Hegel's system, the notion of which Logic treats flies apart into points of matter, held together still, like the rings thrown off from the planet Saturn, by allegiance to their origin. In spirit the notion is real and complete: nature at best is life, the *disjecta membra* of the Idea; but spirit is life and notion too, or the living notion which we call mind.

The *Philosophy of Nature*, as we have it in the *Encyclopædia*,[2] contains, besides the originally published treatise, supplements derived from his lectures, which often illustrate the severe thought of the text by lively and brilliant ideas struck out in the heat of delivery. Besides this volume we have the early system written at Frankfort,[3] the greater part of which is occupied by Nature; and in the *Propædeutic*,[4] which Hegel wrote for his boys at Nürnberg, some pages are devoted to the same subject. It would be an interesting task to compare these three different forms of the philosophy with one another and note their points of difference; but they are in the main identical, and the phenomenology of Hegel's own mind may be neglected in a paper which pretends to give only a sketch of Hegel's general position as a philosopher of nature. The *Philosophy of Nature* is certainly one of the most suggestive, and just as certainly the most perplexing of Hegel's works. It is nearly always mentioned with an apology. Though it was founded on the best knowledge of the time, how small that knowledge seems to be! and then again it is so fantastic and so poetical that it may often be thought not to be serious. For instance, when it is said (p. 151) that the tides are caused by the longing of the moon's parched and lifeless

[1] Read before the Aristotelian Society on 25th Jan., 1886.

[2] Hegel's *Werke*, Bd. vii. 1, *Naturphilosophie*. Where only the page is quoted, reference is made throughout the paper to this volume.

[3] Described in Rosenkranz, *Hegel's Leben*, pp. 99 ff. The section on Nature is pp. 112-123.

[4] Hegel's *Werke*, xviii., pp. 169-178.

crystal for our sea, by which to allay its thirst, who can help feeling that they are much more intelligible in the ordinary theory of attraction? And yet is not this very 'attraction' full of poetry, and actually transferred from human interests to natural facts? And is not the history of evolution itself a great epic, not without its tragic side—the march of destiny in the natural world, and not without its touches of epic irony—the great universal battle of frogs and mice? Wherever science appears to be largest and truest it appears most poetical and most philosophical. However, I do not mean to apologise for Hegel or to defend him: my object is to represent his view of nature as simply as I can and, where I can do so, in my own way, without much use of Hegel's technicalities; and secondly, I wish to point out some of his merits and defects, and to show what bearing his conception may have on some current ideas.

I.

The Relation of Philosophy of Nature to Physics or Natural Science.[1] Physics, *i.e.*, Natural Science, and the Philosophy of Nature deal with the same subject; they differ only in their mode of thought. Science thinks nature, philosophy comprehends it; science casts nature in the forms of the understanding, to philosophy nature is presented in the form of the Idea or Notion: hence the former is said to be a *denkende*, the latter a *begreifende*, *Betrachtung* of nature. It is the outcome of physics, the mode of thinking which the mind is compelled to adopt by science itself. It can only begin when science has already achieved certain results: experience must have been collected and laws discovered before philosophy begins, and it can continue only when checked by experience. The express declaration of Hegel to this effect[2] is sufficient to show the absurdity of supposing that his Philosophy of Nature is an *à priori* construction of experience: it is only experience of nature transformed into thought, and therefore independent of merely individual experience.

This relation of natural philosophy to natural science is repeated in all special philosophies, and in philosophy or metaphysics in general. They are often thought otiose because they do not precede but follow actual achievement. The philosophy of history requires to be preceded by an intelligent account of men and movements, which it uses as

[1] Einleitung, pp. 7 ff.

[2] Wallace's *Logic of Hegel*, pp. 15 ff.; cp. *Werke*, vi., pp. 18 ff.

material for discovering how the idea of the state develops. A metaphysic of ethics presupposes a scientifically arranged description of the facts of ethics. Metaphysics itself must be preceded by the reflection performed by the understanding upon the ordinary facts of knowledge. Science provides everywhere the material of philosophy. To quote a sentence of Hegel which has often been quoted, "The philosophical method is not a mere whim, of walking once in a way for change upon your head, when you are tired of walking on your legs, or of painting up for once your everyday face. It is because the method of natural science does not satisfy the Notion that the step to philosophy is taken" (p. 18).

Let us then explain how it is that science leads on to the philosophy of nature.[1] We begin the study of nature with (1) Observation. Guided by the instinct that the world is rational, observation transforms the isolated individuals into universals, by discovering their marks or general character. On this process are founded the classificatory sciences. The next step is (2) the Discovery of Laws, which is the business of rational natural science. Observation leaves objects in their repose, with permanent general characteristics which distinguish them from other objects: science takes account of the inner negation of things by which they violate this illusory quiescence, negate themselves and other things and place themselves in a process of restless connexion with one another. In discovering what are these active relations science rises a step further above sense, for the sensible facts are transformed into vehicles of a law in which their sensuous character is obliterated, or, as Hegel puts it, "Sense is not in and for itself, but for the law".[2]

In neither of these processes is there a blind subservience to nature, but a mutual helpfulness of nature and spirit which is a prescience of their affinity. It is through this instinct of reason that these laws are regarded as true: not until their defects are observed do we hesitate and regard them as merely probable. Thus science thinks nature, permeates it with reason, epitomises nature by thought, which is the great epitomiser.[3] It thinks nature even in the distinction which in observation it draws between essential and unessential marks: still more in the notion of law. The physicists often imagine they do but follow nature, but they are better than they imagine (p. 6): if they were not, Hegel

[1] *Phänomenologie* (*Werke*, ii.), pp. 184 ff.

[2] *Werke*, ii., p. 189.

[3] Cp. *Werke*, ix., p. 8 (*Philosophie der Geschichte*).

says, the beasts would be the better physicists, for they devour nature and turn it to their own purposes (p. 16).

But though science thinks nature it is imperfect (p. 19), for in the first place its universals are left abstract or formal: they are taken from facts as we find them, abstracted from them, and therefore seem to exist apart from the actual thing. The conception of specific heat, for instance, is derived from observing certain sets of facts, which are generalised under a common name; it is not shown why there should exist particular facts of this quality. That the angles of incidence and reflexion are equal is a general law, common to all instances of light impinging on a mirror; but this law gives only a common quality without assigning its secret.

And with this is intimately connected a second defect, at bottom identical with the former. The content of the natural facts is in the scientific law dissected, and falls into separate parts. Just as a flower is said to consist of various parts, or a body is regarded as a combination of many qualities, strung together by help of the connecting particle 'and' (compare *Phänomenologie*, pp. 84 ff.): so in the law that bodies fall through spaces which vary as the square of the time, body and fall and space and time are unconnected. The content is thus not a complete and concrete whole whose behaviour is the necessity of its nature: for philosophy the law of fall must be shown to follow from the very conception or constitution of matter; it will then be exhibited as a law of distance and time.

It is these imperfections of physics that render a philosophy of nature possible and necessary, the office of which is to exhibit the whole world of nature as a system of ideas, each of its ideas being contained in the supreme and concrete idea of nature.

II.

What then is Nature? The question can be answered properly only in the complete elaboration of the Philosophy of Nature. But in the abstract there are two ways in which Hegel answers the question; the one answer places nature in connexion with the logical Idea, the other in connexion with the idea of Spirit. According to the former, Nature is the self-liberation or the self-alienation, or the otherness, of the Idea; according to the latter, Nature is that which is transcended so as to become Spirit.

(1) The Idea or Notion, Nature and Spirit are the names of the triad which makes up the whole of reality: the last

is the complete expression of the former two in their combination, and it is implicit in each of them. In each of the triad the other two are in fact implied in different ways, and when the Idea is spoken of for itself it is always through reference to Spirit that it has a meaning, and that in fact its process can be discovered. The logical Idea is the whole world of natural and intelligible things in its abstract form, but it is no mere reposeful conception; it is a process, the process of dialectic. It is not merely a process for us, with our habits of learning, but in itself a process, and therefore, like the Platonic dialectic after which it is named, identical with its method. Hence in its beginning its end is contained: the bare category of Being is full of the negativity which is the secret of the Notion, the final result. The office of Logic is to show how simpler and abstracter forms of the Idea are absorbed into the end or total Idea. This Idea is not mere immediateness, such as is imaged by existing things (*Seyn*), nor relation, such as is repeated in nature in the causal connexion of things (*Wesen*), but it is self-determination, such as again is imaged in the will (*Begriff*). As thus complete within itself, turning round upon its own axis, and maintaining its cohesion through its very tendency to fly apart, "returning out of its negativity into itself," it is once more immediate, exists then and there, but it is enriched by all the distractions, all the divisions within itself, all the struggles to rise above itself through which it has passed. This metaphorical language, however, does not mean that the Idea undergoes a process in time: it is a timeless process by which one idea is contained in a higher, which therefore develops out of it: it exists as a whole.

The logical Idea, then, is absolute knowledge, or that which is self-centred. What corresponds to it in religious language is the conception of God the Father. But it is still abstract, purely thought; though defined as the union of thought and reality, and therefore concrete in character, it is out of its own imperfection *as thought* that it has returned into repose. So far it is subjective and needs realisation in another sphere. God the Father must appear as God the Son. The Idea having traversed all its stages has returned to its beginning, to Being, and as such it is that which is, it is Nature. This is no new determination beyond the Idea, which needs not to pass beyond the circle in which it turns, but is the whole Idea as real. It is the Idea as other which is contained in the Idea, and therefore described by Hegel as the self-liberation, or self-alienation and self-resolving

of the Idea: not beyond the Idea, but the Idea itself as really being.[1]

This transition is very obscure, and perhaps impossible; but if we may in an account of Hegel permit ourselves the language of mere conception *(Vorstellung)*, we may think of the Idea as the complete law of the universe. In this completeness, needing no aid from other laws, it is itself something; it is, as it were, condensed into points which we recognise as nature. For things are actually made by the laws which are the relations between them. Hence a perfect law is a perfect system of nature which is its bearer or expression.

Nature is in this way the otherness or the self-liberation of the Idea, and yet permeated or interpenetrated with it, so as to be transparent to it. In his earlier school-lectures[2] Hegel described it as the copy of the Idea, but neither this nor the description I have given is to be understood as equivalent to the common saying that nature is the mirror of God. Hegel might say that such metaphors were true, but insufficient for the abstract nature of thought: they did not explain the real connexion of thought with nature. Still less would he admit that in being transparent to thought nature was in fact a system of spiritual atoms; his coarse common sense would have rejected the vague mystery of such a conception.

But this does not exhaust the logical character of Nature. We have recognised it only as the Idea in the form of immediateness, of existence then and there, in virtue of its being the self-liberation or otherness of the Idea. But being the otherness of the Idea, of that which is always one and single and self-contained, it is the other as such, or it contains in itself the principle of otherness.[3] It therefore falls apart into a multitude of isolated parts or characters, all external to each other; and in its first or immediate form it is Space, the very abstract idea of self-externality, in which every part is indifferent to every other. Hence the accidentality and the blind necessity which constitute nature: it is accidental because of the indifference of its parts; it is subject to necessity because in their indifference they are yet constrained within the unity of nature as a whole (p. 30). This necessary

[1] In expounding the first element in the notion of Nature as the immediateness of the Idea, its otherness as merely being, I am following the transition at the end of the larger *Logic.—Werke*, v., pp. 352-3.

[2] Rosenkranz's Preface to *Propädeutik* (*Werke*, xviii.), p. xvii.

[3] Einleitung, pp. 23 ff.

connexion between two different things which yet form a unity is expressed by the scientific conception of polarity. Nature reveals the difference inherent in its conception as an actual separation of two things: it is the other as other; and Hegel, with a quaint reminiscence of Plato, sees in this the secret of the recurrence in nature of the number four, in four elements, four colours, or even five—one for the notion, two for its difference, one for its return out of difference (p. 31). The accidentality or indifference of nature is thus of its essence, and is exhibited to us in the wild confusion of its forms. Though transparent to Spirit, it is like a magic beryl, full of wild, fantastic shapes: it is a "Bacchantic god" (p. 24): it cannot preserve the outlines and limits of ideas and types, but in its profusion of forms, and in the monstrosities of organic life (p. 651), it varies from them indefinitely. This unity which we so much admire in nature Hegel regards not as its glory, but as its weakness *(Ohnmacht)*, its inadequacy. Hegel never could be induced to admire mere variety or multiplicity: with the true instinct of the philosopher he sought relief from the broken lights of the Idea in the self-sufficiency of the Idea itself; the starry heavens bored him. To him, though its otherness was Nature's law, it was its primal vice or defect, out of which arose its effort to become what it implicitly is, Spirit.

(2) We have traced the connexion of Nature with the logical Idea: we have to show its relation to Spirit. Spirit *(Geist)* is the truth of Nature, which therefore presents itself as a series of stages which lead up to the notion of Spirit.[1] It begins with Space and Time, the bare notion of self-externality, and it ends with organic life, in which nature, though not yet spirit, yet shows that self-concentration, or inward reflection (recognised in its simplest form in the process of assimilation and conservation), which is the prelude to the life of spirit. As the spirit in the forms of Religion is the Holy Ghost as it exists in the minds of the community, the natural man informed with the Idea, which is God, through the medium of the Son, so the Spirit or Thought is the Idea completely realised, a return from its own externality as Nature into itself as Spirit. "The end of nature is to destroy itself, to break through its immediate sensible covering, and like the phœnix from its flames to arise from this externality new-born as spirit" (p. 695). "This liberation from nature and her necessity is the notion of the philosophy of nature." But once more it is necessary

[1] Einleitung, pp. 32-39.

to follow Hegel in emphasising that these stages are not stages of actual natural development, which occurred in fact and were open to the observation of whatever minds may have lived in the past. They are stages in logical development, they grow out of each other by logical necessity: "the forms of Nature are forms of the Notion, though in the element of externality". Each stage is not the historical outcome of the preceding, as we might say that the existing horse with one toe is the outcome of the Pliocene horse with five, but its truth, which was contained in it and is evolved from it by the inner necessity of the notion of nature. The theory of evolution is a theory of the history of nature, and whether it be true or false it is a series of events in time; but the Hegelian development is an eternal process, which is present in its totality at any one moment of nature's existence. It is nature in the form of thought, and a process as thought is. Thus spirit is not a natural product which grows out of nature, but is a conception present throughout nature, higher than nature, and therefore the ground of the possibility of nature.

This development of conceptions may be described as a progressively definite assertion of what is contained in the notion of nature: in each new stage characters which were latent in the preceding come to overt existence (p. 38). The process has therefore a double appearance. On the one hand the more the different parts into which in nature the Idea falls receive a definite character, the more completely is the Idea externalised and explicated, the more does it go out of itself. At first it is like a mist, self-external, but homogeneous, the protoplasm of externality; by and by it forms into definite characters, and ultimately it is organic. But on the other hand the Notion is always present in its external forms, and holds them together into unity; they may resist our understandings, but they cannot ultimately resist the Spirit: and therefore from this side the process is one of ever greater inwardness; "the evolution is also involution," until in life the notion is clear and evident.

III.

Divisions of Nature. The different stages of conception which nature exhibits form the bulk of Hegel's *Philosophy of Nature*. It would be impossible to describe them all, even if I could be sure that I entered fully into the meaning of all of Hegel's distinctions. I shall therefore describe only the main divisions of the subject, and shall

then illustrate by a few examples the minuter elaboration of Hegel's view.

Nature falls into three great stages, each higher than the preceding, the subject of three departments of Natural Philosophy—Mechanics, Physics, Organics.

(1) *Mechanics.* In mechanics Nature is regarded in the abstract, in the simplest and vaguest form of its idea—that of externality: its parts are relieved out of their total indifference to each other by a unity which is merely ideal or potential, not yet so realised in each of the parts as to give them character or individuality one against the other. Mechanics deals therefore with Matter, but as formless: its unity is outside it, in that simple tendency to a centre which we know by the name of gravity. This unity is but an aspiration, an unrealised ideal, a *Sollen* Hegel calls it. Beyond this attractiveness by virtue of which it is in perpetual self-repulsion matter has no other quality (pp. 67-70).

However, matter is not that which comes first in the logical order of mechanical nature. That beginning is the complete and soulless self-indifference of nature which is Space (pp. 44 ff.). Space and Time together are abstract self-externality. They involve each other and combine to produce Motion, the soul of the world, which precipitates matter in its process, in a way which will demand a fuller attention later. Matter and the motion or *fall* by which it manifests the elements in its nature are the sphere of finite mechanics.

There is a third sphere of mechanics, the mechanics of matter in its conception or notion, the mechanics of motion which is not, as in the case of fall, only relatively free, determined by the accidental distance of a body from its centre, but is free absolutely or immanent in matter itself. This is the free circling motion of the heavenly bodies round their central sun (pp. 94 ff.), the system of minor centres which maintain their individuality by their free relation to a greater centre: an image of that restraint and conservation of free individuals which in the sphere of spirit is realised in the state.[1] The special laws of motion, which are known as Kepler's laws, follow from the conception of this system as such.

(2) *Physics.* In all the three portions of mechanical nature it is quantity and quantity only that is exhibited, and all its characters and relations are quantitative. But already in the final form, the free movement of the heavenly system,

[1] *Logik*, iii. (*Werke*, v.), p. 197.

there is attained by means of a totality or system of motions a unity which is beyond the mere aspiration of matter itself. In physics (pp. 127 ff.) this unity has advanced one step further, and has become a form or quality. The matter of which physics treats is individual or qualified, or has its centre within itself. The characters of the Idea becoming more definite in their externality, nature takes a further step in self-reflection, and appears as actually ideal. It is but a little way to that highest self-reflection which exists as the human spirit turning the outer world to its own uses. And the first adumbration in nature of this higher ideality is already the counterpart of the Ego : it is Light, which is matter qualified as pure identity, the self of matter (pp. 130 ff.). Only it differs from the self of spirit because it is quite abstract, bare pellucid identity, undimmed by difference, while the Ego or person is an identity which is maintained through difference, and lives by subduing antagonism; or, as Hegel puts it, " Light is manifestation of itself, not for itself, but only for other " (p. 132). Light spreads through space, but the Ego is a point of unity. Light, then, is the first manifestation of what Hegel calls *Universal Individuality*, the simplest universal quality of nature. It has its negation in the Dark (p. 142), the limit against which it can differentiate itself from its mere identity and be seen as light. For light as such is invisible. Still more complex are the natures of the four elements, Air, Fire, Water, Earth, which with the meteorological process of the elements complete the stages of universal individuality, the abstract determinations of nature in the large. But physics has to deal with more concrete ideas than this : first of all with matter determined in its material form, in which the form is only spatial (physics of *special individuality*, of which I shall speak presently), and lastly with what Hegel calls *total individuality*, where the form is immanent and there is some approach to a truer unity. But it is still only struggling and is expressed still as a relation between two things : it is conditioned and requires another. It appears first as Magnetism, which Hegel regards as the principle upon which figure is formed —a natural syllogism which holds together two sundered points (p. 246). Hence too its law, for, being notional and yet in nature and spatial, it negatives the identical, or repels it. In its highest form this unity appears as Chemical Process (pp. 360 ff.), which destroys the indifference of bodies.

(3) *Organics.* Chemism prepares the way for the final stage of Organics, where Nature first acquires the character of subject, with the power which a subject has of gathering

up all its parts or differences under its own control. In the organism we have no longer a mere relation between bodies, rising at times to a furtively ideal character, but a negative unity which maintains itself by existing in different parts. Such a unity is Life. But as vegetable life (p. 470) it is still simple and immediate, not yet fully expressed, and it therefore returns to its old form of self-externality: its members are a repetition of itself, it is composed of buds and branches, each of which is the whole plant; it is rather the soil in which many individuals grow than a single organised subject. Its parts are not really different, but, according to Goethe's famous theory of metamorphosis, they pass into one another. It never gathers itself together for the collective act of feeling.

But, in the animal, life exists not merely potentially as subjective, but really; the external form is so idealised as to become limbs or members of a whole, and the organism in its process towards without retains its own individual unity (p. 549): it lives by reaction and by assimilation. Its voice, its motion, its warmth are evidences of the freedom of total life to which all its members contribute. And in its feeling it reaches the highest expression of self-contained unity which Nature can hope to attain.

In a philosophy of organic life you would expect to begin with life; and though this part of Hegel's *Philosophy of Nature* is perhaps the most valuable, yet it is one of the most puzzling things in the whole work to find him speaking of the Earth geologically considered as the first form of life, in which subjectivity is identical with the outward organism. The Earth is a system of geological members, the corpse of the life-process by which they were engendered; but though itself the source of all life, its own life is extinguished and is a thing of the past (p. 430).

Before we proceed to some minuter examples of Hegel's method let us note that these divisions of the philosophy of nature correspond to the divisions of Logic and Psychology. The three parts of Logic are the Idea as immediate or Being, the Idea as in relation or Essence, the Idea as returned into itself or Notion. Correspondingly, Mechanics is Nature as it exists immediately, then and there, in Being; Physics is Nature in relation, separate bodies or characters in connexion; Organics is Nature in notional unity. In like manner the science of Spirit treats first of man as natural (Anthropology and Psychology); secondly, of man under relations of law and necessity, which for him are the expression of a world of freedom (Objective Spirit or Morality);

lastly, of the forms of the Absolute Spirit (Art Religion, and Philosophy), in which his complete notion is attained. If each of the three—Idea and Nature and Spirit—shines in reality through the other two, it is plain that a correspondence of this kind is to be expected. It points to the truth that Idea and Nature are each of them abstractly what Spirit is concretely or realised, and that Spirit is its own recovery from Nature. It is a truth which in reading Hegel we are apt to lose sight of, being misled by the delusive appearance of a regular progress from Logic to Nature and thence to Spirit. In reality they are parallel developments, not, however, separate, but mutually involved.

IV.

I will exemplify Hegel's method in detail from each of the three great divisions of Natural Philosophy. These examples will illustrate both the ideal character of facts which in our ordinary experience we learn mainly through our senses and without reflection, and the process of dialectic by which one ideal character is absorbed and held in solution in a higher and more definite one.

(1) *Space and Time.* Space is the first or simplest and most abstract form in which the Idea appears as Nature. It is not, as in Kant's view, something subjective, a form of the mind, for Hegel's philosophy does not deal with the elements of knowledge as they are contained in the mind or the consciousness, but with knowledge as such, which in our consciousness we only recover. We think of matter as something solid and substantial, different altogether from space and time, and we ascribe to it a reality which we deny to them. This is a mistake: space and time are in the world as much as matter, which is, as it were, a condensation of them, much in the same way as in the old Ionic philosophies the whole world was derived from the abstract idea of an element by condensation and rarefaction, that is, by positive and negative movement. Space (pp. 44-5), then, is Nature, but Nature as totally indifferent—it is juxtaposition pure and simple without a break: it is the natural form of the logical idea of quantity, the essence of which is its continuousness and its indifference; no matter where you stop in measuring a thing you still have mere quantity, and you leave the quality unaffected. However, space is not motionless—it would not in that case be transparent to the idea—it has within it the beginning of life or negation; but its life is a weary round which never gets beyond itself: every

moment is absolutely identical with every other, and that is the defect of space. The negation of space is the point, but each point is equally every other, and generates therefore a line and line a surface (pp. 48-9). The point is only the beginning of the line: it is a limit which directs you to go beyond, and yet you are always where you were before. Space is such an eternal monotony as we may figure the life of Mr. Spencer's Unknowable, only unconscious of its own ennui. But this negativity of space by which it is for ever negating itself while it yet remains identical is exhibited in nature definitely as negation in the form of time (p. 52). Such phrases as 'a point of time,' or 'an hour's distance from here to there,' are testimony that space and time are inseparable. Time is the negative unity of externality; it is continuous or self-external, but it is perpetually self-destructive. It is while it is not, and is not while it is; "Chronos devouring his own children," Hegel says (p. 54). It is not made up of moments any more than space of points; but it is an eternal present in which two things are combined, being and not being. Regarded as being which is not, it is the past; regarded as not-being which is, it is the future (pp. 57 ff., especially p. 60). Hence, we may say for Hegel, the justice of the trite comparison of time with a river: only while Heraclitus declared you can never bathe twice in the same stream, we shall have to say you can never bathe twice in a different stream.

For Heraclitus was thinking not of time, but of something more definite, *viz.*, Motion, the logical genesis of which is this: Time though negative is still indifferent, every present is a past; here it combines with space, and the result of their combination is *place*, a spatial now (p. 62). Place is different from point, for a point is anywhere, but place is only one: it is a point of space fixed in time. But place regarded as space is indifferent; it cannot be thought without some other place, to which it *moves*. Of this process of motion matter is the precipitate, it is motion as it were arrested, the limit of motion, the union of time and space. Hence matter and space and motion are interchangeable; on the lever a greater distance acts in place of mass (p. 63 *ad fin.*), or a falling stone may be fatal in virtue of its rapidity—"a man may be killed by space and time" (p. 64).

(2) In Physics the theory of *Special Individuality* affords an excellent illustration of Hegel's method. Special individuality is distinguished from the universal individuality of the elements and their process by its specific character; it is distinguished from magnetism and chemism and electricity,

which are stages of total individuality, by its want of self-completeness. It is as yet not a totality or a system, and therefore it is in form a mere relation between different bodies or parts of a body (p. 188). Matter as specified in the simplest way is *specific gravity* : it thereby holds a place and character of its own as compared with the general filling of space by abstract matter (p. 190). But since matter is essentially self-external, this relation or specification appears further as the definite connexion of material parts in a body, or *cohesion* (pp. 195-205). Such cohesion is of different kinds : it may be simple *adhesion*, *i.e.*, quite indeterminate cohesion, or it may be the *coherence* (p. 205) of matter with itself, its character of yielding to outward force, while in the very act of yielding it preserves its own mode of composition, as, *e.g.*, brittle glass when struck will break up into pieces, but resists extension ; or thirdly, it may be *elasticity*, which is cohesion exhibited in motion, the body giving way and yet maintaining itself. This ideality of matter which exists in elasticity is still more visible in *sound* (p. 205). If cohesion was material space, sound is material time. In sound the indifference or externality of the parts of a body is denied and the body vibrates ; the particles oscillate or momentarily move from their places, but yet they are constrained within the unity of the body and their places restored. " It is the cry of the Ideal under foreign power, but withal its triumph over this power " (p. 209).

It is but a step from here to the nature of *heat*. " It is not only the musician who plays, but the instrument which sounds, that grows hot " (p. 223). Heat is not like sound a mere ideal destruction of cohesion, accompanied by restoration of it, but a real destruction ; and the body under heat expands. In sound the external force of the blow is repelled, in heat the body yields and becomes fluid. " This fluidity of body (*i.e.*, its *real* ideality) is the birthplace of heat, in which sound dies " (p. 224).

(3) Hegel's treatment of the idea of *animal life* is perhaps the most interesting and profitable part of his philosophy of nature, and would well bear a more detailed reproduction than can be given it here. The idea of animal life takes a triple form : it exists first of all as the process in which the organism is self-related, its active unity by which it gathers together the many threads of its organs into one. This process Hegel calls the process of *figuration* (p. 559). This process too is threefold in character, and, as one of the most suggestive results of Hegel's work, deserves a short description. It is often recurring in Hegel, and plainly it was to

him a fascinating thought. These three elements are sensibility, irritability and reproduction. In sensibility the animal is receptive; the suggestions that come from each part are transformed by the identity of the subject, it is the universal suffusion of the whole animal as a unity. Its irritability is its reaction against external stimuli, whereby its special character is maintained. In reproduction or self-preservation we have the combination of this universal sensibility and this particular reactiveness to form the individuality of the organism: the animal through feeling and reaction reproduces and preserves itself.

The second stage of the idea is the process of *assimilation* (p. 595), arising from the antagonism of the animal to inorganic nature, which it therefore turns to its own uses, renders subservient to its own unity, assimilates: theoretically through the medium of such senses as sight and hearing, practically through other senses. What is here to be enforced is that the relation of the organism to its environment is not one of causality, but is a life-process in which the result is determined by what the organism is to be. Not in its past only, but in its future also lies the secret of selection. The environment is assimilated only so far as it has in it what is needful for attaining the end of the organism.

Lastly comes the relation of the individual organism to its genus (p. 640), and this too has different stages. The individual is after all only an individual, inadequate to express the universal character of the genus. Alone, he imperfectly attains the end of the genus, and this imperfection implies that the feeling of self be realised by union with another individual, as it is in the relation of the sexes (p. 642). But the result of the union is still simply to perpetuate the genus in individual form at the cost of the lives of the parents. The genus is still unrealised. But the sexual relation is the defect of the individual, because he represents one side, and one only, of the generic idea. In its highest form, however, the relation of genus and individual is exhibited in natural death (p. 691). This is due to the disproportion of what the individual is and his real self or genus, what he is trying to be. He carries within him from his birth the seed of death, which when it comes is the victory of the type over the individual. From this death of nature arises Spirit.

V.

Hegel's Totality of view. It will be through some failure in the execution if the foregoing account has not made

two things clear : (1) However abstract and difficult the process is, and however unacceptable particular conclusions may be, yet Hegel's Philosophy of Nature is an attempt to understand the forms of nature as they really are apart from the ordinary prejudices with which we approach the study of them. It is so difficult just because it demands the effort of following the order of thinking instead of the order of experience. And (2) that its distinguishing feature and merit lies in Hegel's sense of concreteness and totality, his habit of regarding things as a whole, according to the place they occupy in the system of nature. Hence it is he separates many things which are usually put together. He will not regard the four elements as chemical compounds because their function is not chemical (p. 159) ; though he knows of the equivalence of electricity and magnetism and heat, he refuses to identify them (p. 260). He separates colour from light, and the sensible qualities of objects from the senses of animals. The whole of the system may be described in fact as an attempt to arrange natural facts according to their logical function in the economy of nature. Here indeed, as elsewhere, the dialectical process seems to be guided by a sense of logical propriety, an instinctive presentiment of what must come next in the order. Experience is always suggesting its facts, and it is only because it is kept in the background that the dialectic seems to have prepared for us, after many anxieties of abstract thought, the surprise of a familiar face. It is a logical re-arrangement of experience, and logical because instead of regarding experience from many different points of view, or in abstraction, like the special sciences, Hegel treats it as a whole, in the concrete. Hegel's abstract thought is for ever battling against abstraction. It is this concreteness or totality of view, the philosophical counterpart of common sense, that determines Hegel's attitude both to previous philosophy and to the methods of science.

(1) *Hegel's relation to previous Philosophy of Nature.* It is no part of the present article to trace the connexion of Hegel's philosophy of nature with Kant's and Schelling's. To Kant, especially in his conception of organic life *(Critique of Judgment)*, Hegel's debt was immense. The amount of his indebtedness to Schelling I am not able to measure. It is in his attitude to Kant's conception of matter that Hegel's totality of view is plainest. In the *Metaphysical Elements of Natural Science* Kant had given a ' construction ' of matter, an account of the conditions of its possibility. He resolved matter into two fundamental forces, one of repulsion, the other of at-

traction. The force of attraction was, according to Kant, the force by which matter 'occupied' space, that of repulsion the force by which it 'filled' space: the former was a penetrative force which could act at a distance, the latter acted as a surface-force between two parts in contact. Without the combination of these two independent forces matter was impossible; but while repulsion was of the very inner essence of matter, attraction, though necessary to it, was not contained in it. The value of such a conception was vast; it attributed to matter in itself, to the very nature of matter, forces which had been regarded as the accidental properties of bodies in their relation to each other. Yet it was still, Hegel thought, a one-sided conception, an abstraction;[1] it was in fact a formulation of the elements contained in the popular notion of matter. The force of repulsion corresponded to the resistance offered by bodies, the force of attraction to their consistence or cohesion; and the former being the more obvious and striking received the first position. These two forces were then left apart in independence of each other, in order to render matter possible by their combination. But Kant's argument was transparent enough to show the real connexion of the two. He proves the necessity of attraction because repulsion alone would expand matter beyond measure.[2] Such an expansive force of repulsion would act at a distance and therefore be attraction. This identity of attraction and repulsion in matter is in fact the truth of the conception of matter. Attraction is the secret of the coherence with one another of the units, which, for their independence, require other units to repel. The parts of matter are like the members of society, who are linked to each other and attracted by moral and social laws, which assign to each his *different* position in the system. Like such persons they might say to each other in familiar language, 'I love you, *therefore* keep your distance,' or, more abstractly, 'we repel each other and are different, the better to show our identity'.

(2) *Hegel's relation to Science.* Where Hegel comes into conflict with contemporary science, it is because of its want of that ideal concreteness of which Goethe had taught him the value. Instead of seeing things as wholes, it saw special characters and converted them into realities. It is thus he rejects the notion of pores and atoms. The idea of pores

[1] Hegel's brilliant criticism of Kant's construction of matter is to be found in *Logik*, i. (*Werke*, iii.), pp. 200-208.

[2] Kant, *Met. Anf. d. Naturwiss.* (Ed. Rosenkranz), p. 359.

(p. 190) was invented to explain the different specific gravities of different things occupying the same volumes. It was supposed that though the particles were alike in all bodies there were fewer particles and more pores in the lighter body. In the phenomenon of elasticity where the particles seemed to penetrate each other, it was supposed the body was compressed by the restriction of its pores. In asserting this negative element of pores, science, Hegel saw, was betraying its sense of the negativity inherent in matter; but instead of being the negation *of* matter involved in the nature of matter, these pores were a negative set up as a real existence *beside* matter, as actually existing where matter is not (p. 203). The same metaphysical assumption vitiated the conception of the atoms and the void. The atoms are not separate material existences; whenever we speak of material parts, we mean only quantitative differences, which not only do not preclude continuity but require it (p. 202). In elasticity, where the particles seem to take each others' place, we have exhibited in matter only the same contradiction of continuousness and punctuality which constitute motion. Elasticity as we saw is cohesion in motion. If then we regard atoms as individual things apart from their continuity, that is, their ideal character, it must be from motives of convenience. And here we find Hegel in agreement with a great modern exponent of the atomic doctrine, Lotze. In just the same way Hegel refuses to hear of the separation of light into pencils. They are a convenient supposition; to regard them as real would be as if we were to separate time into parts because we can speak of 'Cæsar's time' or 'my time' (pp. 140-1).

This metaphysic of independence, which science, with all its professed allegiance to experience, assumes without warranty from experience, had run to greater lengths in Hegel's day than in our own. In Hegel's time (if Hegel will forgive us the expression) they talked of caloric, the substance of heat, of latent caloric for specific heat, and of the electric fluid. We have given up, partly, this way of thinking; but in judging Hegel it is fair to remember that he helped to release science from the metaphysical superstitions which retarded its progress. By so doing, he was among those who gave science security for its advance. Even now it needs again and again to be reminded of the warning which he gave so forcibly against its ingrained habit of hypostatising qualities:

> "Donec longa dies, perfecto temporis orbe
> Concretam exemit labem."

Hegel and Newton. The noise of Hegel's attack upon Newton, once very audible, has been almost smiled away; yet the opposition rests exactly on the same grounds. Hegel is on the side of totality, Newton on the side of distinction and analysis. The world has taken the side of Newton and declared for analysis.

Let us begin with the theory of Colour (pp. 298 ff.). Colour appeared to Hegel (following what he called Goethe's great sense of nature) to be, in its real place in the world, the union of two things, the abstract identity of light, and the principle of darkness which is embodied in solid or coherent matter. There is therefore a real light and a real dark, which generate colour by their blending. Colour then is a later stage of nature than light, for it is possible only when matter is specified out of its abstract self, which is light, into its difference, so as to have specific gravity and cohesion. Colour then is the obscuration of light by the dark, and it is seen in experience only when there is an interruption of transparency. The prismatic colours are upon this theory caused by bringing light over the dark prism, which limits or interrupts the light, partly by its edges, partly by its varying thickness. Here again Hegel will have facts as they are, as a whole. Colour is not an element in light as it is on Newton's theory; colour is, as everyone knows, darker than light. How should light be composed of many darknesses? But wherever there is a difference of light and dark, there is the specification of light as colour, as round the edges of a candle-flame in the day-light. Newton, on the other hand, finding that light has broken through the prism into a spectrum of colours, declares these colours to be the components of light. In thus analysing light, he seemed to Hegel to be inverting the real order. He did not take into account the whole phenomenon. He neglected the existence of the prism itself, which, by its presence, conditioned the colour. The prism itself was the dark which imparted difference to this abstract light and coloured it.

But it was in the field of Mechanics that the chief assault took place. Hegel's complaint against the mathematicians was that they converted distinctions made for the purposes of analysis into existing facts. With this weapon he attacks first the proof of the law of fall, and then, with all the violence which he employed against those who differed from him, the Newtonian theory of the movements of the heavenly bodies. The law of falling bodies, to take the simpler case first, is that the distance traversed varies as the square of the time, $s = \frac{1}{2}gt^2$ where g is the acceleration, $\frac{1}{2}g$ the dis-

tance traversed in the first unit of time. So far as this can be proved mathematically, apart from experience, it must be as follows: that in uniformly accelerated motion velocity varies as the time, $v \propto t$; substitute for v, $\frac{s}{t}$; and $\therefore s \propto t^2$. But this purely mathematical substitution of $\frac{s}{t}$ for v is converted into the assumption that there are two forces acting upon the body, one of acceleration, which at each moment gives a new and equal impulse, the other a force of inertia of which the motion persists through one unit of time with the velocity with which it begins it. But in reality, in Hegel's view, fall is the motion which is immanent in body in virtue of its central tendency; being therefore free motion it must exhibit the character of the notion or idea of motion. Its components, therefore, space and time, must be not indifferent to each other, but so determined as to be identical. In ordinary uniform motion, which requires an external force to start it and then depends upon the inertia of the body, space and time have no real relation to each other: if time is to have such a real relation, then it must negate or destroy its own punctuality; only so can it become comparable with the indifference or externality of space. Time, then, must acquire the quality which it obtains by squaring,[1] by being reflected back on to itself, and so translated into externality. The space traversed, therefore, being proved to vary as the square of the time, the other factor in the formula is discovered by actual trial.

Hegel's attack on Newton's theory of the heavenly motions (pp. 97 ff.) is of the same character. Newton explained the heavenly motions by the combination of two separate forces, one an impressed centrifugal, the other an attractive or centripetal force. Hegel's objection to the separation of them is no less great than to Kant's assertion of the distinct independence of repulsion and attraction. Hegel does not deny the convenience of the distinction, but he accuses Newton of mistaking the directions into which the motion is resolved for real and actual forces, independent of each other (p. 102). But these two forces are not different and independent, but identical in the same way as repulsion and attraction, two elements of the total motion which involve each other: they are not combined externally, but exist only in their union.

[1] Compare *Logik*, i. (*Werke*, iii.), p. 389 (Das Potenzenverhältniss), and pp. 334 ff.

The laws of Kepler must therefore follow from the conception of the heavenly system as a whole. It would be too long to follow Hegel's proof of all three laws. The proof of the third law, that the squares of the times are proportional to the cubes of the mean distances, is at once the most difficult and most interesting by its contrast with the proof of the law of falling bodies. In the relatively free motion of fall, time and space were related as square and radix; but the heavenly motions are completely free, the image of the notion in the mechanical world. Each element is therefore itself a totality, and there is no accidentality in either. But time in the first power is a mere abstract number, so many minutes or seconds or years: to have quality it must be self-related, must be taken in the second power. Space on the other hand—in this case the linear radius vector of the planet, which is a measure of the arc traversed—must attain the dimensions which are adequate to the notion and be taken as a whole or in the third dimension, and therefore as the cube of the linear distance.

What a waste of ingenuity it seems, and with what naive effrontery Hegel attacks ways of thinking the most familiar to the human understanding! How, we are inclined to say, would Hegel have discovered the necessary determinations of space and time except he already knew what they were to be? The answer would be: It would certainly be impossible; but it was by actual experience that the philosophic notion of space and the planetary system was suggested. Kepler discovered the laws of the planetary motions and Newton subjected them to mathematical treatment. These distinctions have their value in mathematical analysis. It is for philosophy, Hegel might say, to accept these results, only to see them in a new way—whence Plato called philosophy a turning round to the light. It has to clear up the categories used in the sciences and to found its treatment upon the notion of the thing as it really is. And strange as Hegel's method of proof may seem, we cannot help seeing the value of his totality of view: he will not dissect nature, but will in each conception take it as a whole. How this may illumine familiar facts we can conclude from his treatment of the First Law of Motion. The motion contemplated by that law is not the motion of fall, but ordinary impressed motion, and it asserts that a body will persist in motion or rest till altered by some external cause. This is nothing but motion and rest regarded in their identity; if a body moves it moves, and if it rests it rests (p. 78). What if after all the sciences should turn out to be only provisional,

partial aspects of the truth, needing to be combined by philosophy as in a stereoscope, to give them solidity and reality?

After so much said in praise of Hegel, it is time to recur to a subject which was mentioned at the opening of the paper, and to indicate where Hegel has failed and what remains to do. Grant Hegel his initial abstract conception of nature, and his elaboration of it in detail, though it is full of difficulties, and often merely fantastic, yet is suggestive and luminous to a great degree. The difficulty lies in conceding the beginning. The central question which Natural Philosophy has to solve is the question, how does there come to be such a thing as nature, or in Hegel's own language, why did God determine to create the world? This question Hegel converted into the only form in which it is subject for philosophy—What is implied in the notion of nature, and what is its connexion with the divine idea? Whatever value be attached to Hegel's answer, he has done this great service, of indicating to what point the effort of philosophy must be directed. His own answer we have had already: nature is the Idea in its otherness, and therefore external to itself; and from this a step further is made to the complete indifference of nature and to its confusion of forms, its inability to preserve its types. This solution of the ultimate problem is plainly insufficient: the transition is unclear from the Idea to nature. Perhaps he was led to make it by his theological studies, and the profound impression which the conception of the Trinity left upon him. And certainly as illustrated by reference to the religious consciousness it receives a remarkable accession of clearness; even then it seems hardly more than the formulation of a fact, without a reason for it. And the illustration is not available for those who, sceptical as to the notion of the Trinity, wish to be shown the logical necessity of nature in its own right. Moreover, there is in Hegel's account of the relation of Idea and nature an ambiguity of language of which he sometimes seems to take advantage: the ambiguity of nature in the form of otherness, which may mean simply nature as other than the Idea, or nature as the Idea itself displaying otherness. The latter is certainly Hegel's real intention (cp. p. 23), but to the former is to be attributed something of the satisfaction we experience in reading Hegel,—that though nature is transparent to the Idea it is different from it.

But it is in its failure to explain the variety of nature that the chief defect of Hegel's conception consists. From the self-externality of nature we can conclude its falling asunder

into characters which "give the appearance of independent individuals"; but what reason is there that these individuals should vary from the common type? Hegel would answer that the confusion is of the essence of nature, and that philosophy has done its work when it has explained the existence of variety in general, and it is not called upon to deduce any individual thing, like the "pen of Herr Krug". And doubtless this answer would be sufficient if only from self-externality confusion could be inferred, but it is this which is in question. Hegel admits that every now and then nature in her wildest freaks surprises us with a glimpse of the Notion, but is not this intermingling of notional and accidental a fact to be explained? The economists of the older Ricardian school, who held that the laws of their science were abstract laws, were ready enough to modify them when a body of actual, complicated facts presented itself which allowed of scientific treatment. May it not be that the inability of philosophy to understand the great body of facts familiar to us as variety, modification, multiplicity, accident, is not due to the weakness of nature, but suggests a problem for philosophy itself?

VI.

Modern Theories. Perhaps it will help to enlighten Hegel's conception of nature if we consider it very briefly in its bearing upon some modern theories, which we may discuss in the spirit of Hegel when we cannot be guided by his actual words. Two views have been mentioned in the preceding pages, the doctrine of evolution and the various theories which endow the atoms and molecules with souls or mind.

(1) *Evolution.* The belief in special acts of creation which evolution has driven from the field would not have delayed Hegel long. Such a belief implies the merely mechanical conception of a God existing outside a world which also exists as an eternal uncreate. But nature is not external to the idea, but involved in it. If then it is taken as a whole, it is not created by a definite act before which it did not exist, for it shares the eternity of the idea and is timeless. Regarded as the process in time by which nature maintains its character, it is for ever created, or is a perpetual creation.[1] If it is taken in its parts, these certainly do begin to appear, but they are no more special creations for that than if they

[1] Cp. Einleitung, pp. 25-26.

could be shown to have descended from one original stock by gradual descent.

On the other hand, between the doctrine of evolution and Hegel's theory, how great the likeness seems to be! When Hegel speaks of nature as a process in which, with ever increasing specification of external characters, there is an ever completer involution or reflexion of these parts to a centre, we seem to anticipate the law of progress from indefinite incoherent homogeneity to definite coherent heterogeneity. Hegel's philosophy is in fact an evolution, called by the name of dialectic, which is the counterpart in philosophy of what evolution is in science. That theory he knew in the form which was given it by Treviranus and Lamarck, and he speaks of it slightingly. "This is called explaining and comprehending nature," he says, and he contrasts it unfavourably with the ancient doctrine of emanation, which had the merit of interpreting the less perfect forms of nature by the higher out of which they arose (pp. 34-5). We have already seen how different the two theories really are. Evolution is a history of how things in nature come to pass; dialectic is the process by which one idea logically leads on to the higher idea which is implicit in it and is its truth. Evolution is a history of a process in time; dialectic is a history of ideas which form a process not in time.

In the systematic theory of evolution it is sought to derive all existence by gradual steps from the two elements of matter and force, and though no proof has yet been given of the continuity of the process between inorganic and organic life, the theory is verified by the discovery of first principles common to mechanics, to physics, and to organic life. Hegel would have granted that similar laws do indeed hold in all departments of nature; but he would have called such a discovery an external generalisation of reflection, and he might have added what he says of the doctrine of metamorphosis, "It is important to maintain identity, but equally important to maintain difference" (p. 35). The forms which realise these laws perform a different function, and it is this difference of function which philosophy has to explain. Life may be shown to be a complicated mechanism, yet it has a different function from mechanism, and it is therefore distinguished in idea and called by a different name. It is this difference of function which is the secret of the repugnance of the ordinary mind to accept the derivation of organic from inorganic nature.

The less comprehensive system deals with life only, and it may assert, as Prof. Huxley once did, that all forms of life

are derivable from protoplasm, or it may, like Darwin, simply show how various species are all derived by a process of selection from some few great types of ancestors. There would be something to say from Hegel's point of view to both these theories alike. But in regard to the first he would have a special complaint. To show that protoplasm is the basis of all life is not to show that life begins with formless or inorganic protoplasm. Such a view would confuse an element in the notion of life (perhaps he might have called protoplasm the substance or the element of self-identity in organisms) with the beginning of the history of life. To trace all animals from protozoa is intelligible; but in the protozoon the protoplasm is already an animal, and its nature can be understood or interpreted by the higher form of developed animal life.[1]

Some of the difficulties felt nowadays would not trouble Hegel. For instance, the impossibility of distinguishing plants and animals he would with his cool assumption have put down to the weakness of nature. He would rightly maintain that the functions of animal and vegetable life are different, and perhaps we might add for him, that even from the view of evolution the matter was of no great importance, for it is not at the summit of vegetable and the base of animal life that there is this coalescence of forms, but at the bases of both. But taking the case of animals only, he would maintain that there was only one type of animal, the notion of which philosophy had to explain, and the forms of animal life were but stages in which the type or idea of animal was realised to greater perfection (p. 653). This would be asserting that the nature (the logical or metaphysical nature) of animals was different from their history or genesis. And from this point of view he could perhaps enlighten the process of natural selection and regard it as the struggle of the idea of animal life with the externality or accidentality of its realisation in nature, and this is really his account of the relation between species and genus—the fundamental conception of zoology: the effort of the species to maintain their type appears in nature as their internecine struggle (p. 649). By such a view, the history of evolution would be maintained but with two advantages. In the first place the variations which in the doctrine of descent are so perplexing, at one time seeming required as the conditions of the selective process, at another depending for their existence on this process,

[1] For the substance of this paragraph I am indebted to Dr. J. H. Stirling's admirable pamphlet *As regards Protoplasm.*

would be explained as due to the accidentality of the genus as existing in nature. How insufficient such an explanation at present is, has been already indicated. But in the second place there would be a reason assigned for the survival of the fittest : a variety would survive and drive all its competitors from the field, because it was the vehicle of the animal type. Because of its future it would be able to enter into that reciprocal action of organism and environment, called adaptation, which is as much a selection by the former of the conditions under which it can develop, as the dictate of the latter which organisms it will suffer to develop.

A remark which Hegel makes in another connexion might be useful to some forms of the theory of evolution in the way of a caution. Hegel, in explaining his own conception of nature as that of a series of stages, adds that these stages are conceptions, and the progress is not therefore supposed to have occurred in nature in the actual history of development : because one animal has one chamber and its descendant two chambers in the heart, it is not to be supposed that the former actually acquired an extra chamber in addition to its original one (p. 34). What Hegel means by this is that a new idea or new realisation of an idea is a new fact, and it is not necessary that nature should go through the tedious process of gradual deviation from the older and approximation to the newer type, any more than it follows, because the larger idea of freedom under which we live in England is the outcome of the Greek idea of freedom, that the Greeks actually turned into Englishmen. This may or may not be true as a fact of natural history ; but the habit of turning a logical category into a fact of existence seems to be the defect of that form of evolution which maintains that the surviving variation was that lucky guess out of a number of other varieties which happened to suit its surroundings. Why should the lucky survivor have been among the guesses of nature at all ? Can we believe that if it had not been so some other stronger member would have survived and the new species changed its character : or must we suppose that the varieties would have exterminated each other in internecine struggle until a fresh set of varieties could be tried ? Finally, what guarantee have we that all possible varieties have been tried ? The fact before our view is that a species has been modified in some particular way, the rock pigeon into our domestic pigeon. Two interpretations of this fact are possible : we may describe the process as above (and doubtless we shall find in many cases that the struggle actually has taken place) ; or we may say

that the existence of a new species is the logical exclusion of all others that might have existed. This logical fact may have had its counterpart in many cases in the history of evolution, but not necessarily; just as to do a good act implies logically the rejection of a bad act, though the idea of actually doing the evil may never have entered the agent's mind. And moreover we shall ask for a reason why this particular modification should survive, for to say that it survived because it drove its competitors from the field is only to say that it survived because it survived. In the derivation of the pouter from the common pigeon a reason is to hand in the design of the breeder, in a conception of his mind. May the new species have survived because it was the bearer of a conception also, that conception which I have described as its function in the progressive order of nature?

(2) *Theories of the Animation of Matter.* There is a way of thinking very prevalent at the present day among eminent men of science who speculate upon the real character of the distinction of mind and matter: in one form or another they endeavour to animate nature with souls. We seem to be returning to the days of Thales, who believed that the world was full of gods. At one time it is the atoms which have souls, at another it is the cells (Haeckel). A very remarkable theory of the late Prof. Clifford regarded the molecules as possessed of mind-stuff, which when present in sufficient complexity, as in man, became consciousness. Hegel's assertion that nature is in reality Spirit, or that it is the Idea in the form of otherness, might seem to have a superficial likeness to such theories, but is in reality whole worlds apart. It is difficult to know exactly how Hegel would have treated these theories, for they were unknown to him. He was familiar, of course, with the doctrine of Leibniz, that matter was composed of substances called monads, possessing consciousness, each isolated from the rest, but by a marvellous pre-existing harmony reflecting the whole. But such a theory was a purely metaphysical one, and he treats it on logical grounds, finding in it the opposite and complementary defect to Spinoza's,[1] that it laid out the Absolute into isolated centres of individuality which could only be connected arbitrarily. In his theory of atoms endowed with souls Lotze corrected the mechanical character of Leibniz's theory, for the life of the atoms concentrated into what he called their souls was essentially a life of behaviour to one another, they existed only in their interconnexions. But this

[1] *Logik*, ii. (*Werke*, iv.), pp. 197-9.

theory which Lotze put forward in the *Microcosmus* he never perhaps really maintained as an atomic theory, and in his later system the atoms have ceased to be animated and have become in reality a metaphysical explanation of matter, centres of force, or rather points of intersection of the forces which constitute the relations between so-called 'atoms'. It is mentioned here, however, because it is a theory which naturally occurs to many minds. One objection Hegel would have had to it, that it erected mere conveniences of thinking into real existences, would be avoided by the doctrine that the cells or the molecules have souls, for their existence is beyond doubt. Clifford's theory of mind-stuff is a different one, and has difficulties of its own. Its merit is that it retains a distinction between organic nature and inorganic things whose mind-stuff neither feels nor thinks; and the same merit belongs to the view of Schopenhauer, the progenitor of many of these theories, who regards the different stages of nature as different ways in which the will objectifies itself. But the distinction, in the theory of mind-stuff, is not drawn out or regarded as anything more than a matter of complexity, and we need to be shown how a difference in degree of complexity can produce a difference of quality. Moreover, if mind-stuff neither feels nor thinks, it is difficult to see why it should be called mind-stuff, or how it can have anything to do with mind, and such an inference does certainly not follow from Prof. Clifford's premisses. This is pointed out in a new version of the animate theory of nature (that of Mr. Romanes in his Rede Lecture[1]), which very reasonably identifies matter (*i.e.*, motion) and mind, absolutely, and regards them as only different ways in which we conceive the same ultimate reality of mind. Subtle as this theory is, it is almost impossible to understand how if mind and matter are only 'relative to our modes of apprehension' the ultimate reality of mind should be apprehended by one of the modes in which it is apprehended.

What would have made all these theories repugnant to Hegel would probably be their mystical character; for mysticism is that mood in which the mind is lost in the bare contemplation of a unity into which all differences are submerged; and Hegel with his common sense would have been quick to see that, in their yearning to find a single explanation of the world and, if possible, to give it the elevation of the spirit, these theories were guilty of the

[1] *Contemporary Review*, July, 1885.

overhastiness of thought which is the first symptom of mysticism. If he had been writing upon them, he would not have been content to enumerate them as I have done, but would have shown their origin in some logical secret of the mind, which he would have expressed in a peculiar language that might have required the study of all three volumes of the *Logic* to understand. But in lecture he might have added, through much nervous coughing, a commentary something like this:—'We recognise what is of value in this way of thinking, that the spirit is at one with nature in spite of its apparent antagonism. The spirit must retain in its outside-of-itselfness its at-home-with-itself-ness (*muss in seinem Aussersichseyn sein Beisichseyn erhalten*). But such theories wipe out (*verwischen*) all distinctions by *identifying* the lower with the higher. They thus commit the opposite mistake to those who, treating mind like a machine, interpret the higher by the lower. Hence the greater attractiveness of the former theory to the metaphysical instinct, since its measure is the spirit. It has the attractive force of innocence, for it does not perceive that it evades the very problem to be solved. The office of the philosophy of nature is to explain how it is that nature, which is penetrated by the spirit, can in the first place be different from spirit and next is by insensible stages overcome so as to be spirit. The spirit must come forth out of that which is not spirit. It is the mysticism of the reflective understanding to cut the knot by identifying spirit straight away with that which it is not.' And then with the harshness with which he often treated views that he did not like, he might have added:—'The understanding, unaware of the difference of the Idea, and finding nature rebellious against the spirit (*widerspenstig gegen den Geist*), must needs people it with ghosts'.

IV.—RESEARCH.

THE TIME TAKEN UP BY CEREBRAL OPERATIONS.[1]

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IV. *The Will-time.*[2]

In the experiments described in the foregoing section the motion to be made was always the same, and took up the same or about the same time. In this section the nature of the motion depends on the nature of the impression. The experiments about to be described will throw further light on the Perception-time, but we shall find in addition a variable Will- (or Motor) time. The perception-process, further, is different from what we considered in the foregoing section: then the observer expected a certain impression and saw whether it was present or not; in the experiments now to be described the observer, not awaiting a given impression, had to identify the one occurring. We might perhaps expect the perception to be more difficult and consequently to last longer in the latter case; the experiments however show that there can be no great difference in the time.

Experiments have been made in this direction by Donders[3] and others, they letting the observer lift his right hand if (for example) the light is red, the left if it is blue. Under Wundt's direction Merkel[4] extended this method, the observer lifting a different finger for each of ten different impressions. My first experiments (carried out in the winter 1883-4) were made with aid of electric lights, as above described, and were similar to those of previous experimenters; they gave as the time for distinguishing the colour and choosing the motion 120σ for B, 168 for C. Afterwards I used the gravity chronoscope, which enabled me to use daylight reflected from coloured surfaces. The current controlling the chronoscope was led through two keys (K and K′ Fig. 8, MIND 42), the observer holding one closed with his right, the other with his left hand. Two colours, say red and blue, were used in the same

[1] Concluded from MIND 42 and 43.

[2] I use the term 'Will-time' for lack of a better; in Germany 'Wahlzeit' is used. The motion is in most cases simply the result of the perception, and 'Association-time' might be used, were it not already taken up. 'Motor time' would perhaps best explain the process, but might cause confusion.

[3] *Arch. für Anat. u. Physiol.*, 1868.

[4] *Phil. Studien*, ii. 1.

series of experiments. If red appeared the observer lifted his right hand, if blue his left. The times are given in Table XXIX., the pairs of colours used being red and blue, and green and yellow. The reaction on red and on green was made with the right hand, on blue and on yellow with the left. Each number gives the average of six series (78 reactions in the uncorrected series).

TABLE XXIX.

		B				C			
		R	V	R′	V′	R	V	R′	V′
27. XI.—2. XII.	Red	291	27	289	18	342	39	322	32
	Blue ...	296	27	296	18	332	25	320	22
1.—5. XII.....	Green..	289	25	286	17	354	32	351	18
	Yellow	303	28	306	20	334	34	332	23
	A.....	295	27	294	18	340	32	331	24
	False...	9				3			

If from the average time for the four colours we substract the simple reaction-time, we find that it took B 145, C 190σ to distinguish the colour and find the proper motion. If these times are compared with those given in the preceding section (Table XVI.) we find that it took B 18, C 34σ longer to send out the proper and corresponding motion, than the command sending out a motion already determined. As I have already remarked, the perception-process is slightly different in the two cases; it being necessary in the first to see whether the light is red or blue, in the second only to recognise the red light. The results of the experiments show that there can scarcely be a difference in the times taken up by the two processes.

Quite a similar method was used with letters, the observer lifting his right hand if A was present, his left hand if Z. The numbers given in the Table are taken from six series.

TABLE XXX.

		B				C			
		R	V	R′	V′	R	V	R′	V′
4.—10. XII.....	A.....	328	27	324	18	379	42	370	30
	Z.....	339	23	336	15	382	34	379	22
	A.....	333	25	330	16	380	38	374	26
	False	8				3			

The perception-time was thus for B 38, for C 40σ longer than for colours, and the will-time for B 11, for C 43σ longer for the choice between two motions than for the choice between making a motion and not making it.

In most of my experiments the motion corresponding to the impression was made with the organs of speech. I consider the time of special interest, as we are constantly reading a word, naming a colour, &c. In the experiments first to be considered two impressions were used; the observer did not know which was to come, but named the one occurring as soon as possible after seeing it. The motion was registered by means of the sound-key. These experiments are an extension of those given in Tables XVIII., XXII., XXVII. and XXVIII. There the observer made a determined motion (*i.e.*, named an expected object), here the motion had to be found after the impression had been distinguished. The relation between the processes is exactly the same as when the motion is made with the hand, the only difference being that we are constantly giving the name blue (for example) to a certain colour, whereas the association between a motion of the left hand and the colour blue must be made for the experiments. The impressions were taken in pairs as indicated in Table XXXI. 26 reactions were made as usual in a series, 13 on each of the two impressions.

These results in Table XXXI., when compared with those given in Tables XVIII., XXII., XXVII. and XXVIII., give the increased will-times shown in Table XXXII.

We have already seen that with the hand B needed less additional time than C to make the choice between two motions: the difference between the two observers is still more marked when the motions are made with the speech organs. Table XXXII. is further interesting in showing a difference between letters and words on the one hand, and colours and pictures on the other. The association between a printed letter or word and its name requires less time, and is consequently closer than between a colour or picture and its name. We can understand this, as the former association is being more continually practised; still we could not have foreseen it, as the association between a colour or object and its name is formed long before we learn how to read.

In the experiments now to be described there were not two objects and two corresponding motions, but a large number of objects; the one occurring to be named by the observer. In this case we determine the time it takes to see and name an impression, as a word or a colour. We have in the preceding section determined approximately the time taken to see an object: the difference between the two times gives us the time it takes to name the object. We shall first consider the time needed to see and name a letter. All the letters of the alphabet (capital letters of the largest size in the text of MIND) were used, each occurring once in the course of the series. After thirteen series had been

TABLE XXXI.

		B		C				B		C	
		R	R′	R	R′			R	R′	R	R′
17. II.	A.....	346	353	439	440	19. II.	Mind...	339	332	432	435
	Z.....	338	341	398	390		Life.....	294	298	406	401
19.....	B.....	366	366	415	420	21.....	Time....	296	305	379	382
	M.....	338	332	435	434		House...	285	291	368	363
21.....	E.....	326	321	384	383	24.....	Child...	355	350	410	415
	S.....	300	294	391	386		Year....	361	364	409	411
24.....	P.....	354	352	387	382		Truth...	303	297	392	390
	T.....	350	341	436	429		Name...	329	324	397	399
26.....	O.....	292	296	425	421	26.....	Light...	339	339	421	424
	L.....	323	308	412	408		Ship.....	294	298	396	395
	A.....	333	330	412	409			319	320	401	401
	AV.....	24	17	28	19			24	16	21	14
17. II.	Red.....	342	329	472	479	17. II.	Watch..	350	343	458	447
	Blue.....	317	322	441	447		Ship.....	376	387	424	422
19.....	Green...	303	298	484	474	19.....	Eye.....	369	367	495	488
	Yellow..	309	301	499	502		Hand...	346	333	455	445
21.....	Black...	347	354	386	382	21.....	Tree.....	340	336	455	459
	Pink....	298	305	394	376		Bird.....	343	339	451	447
24.....	Violet...	293	288	395	370	24.....	Fish.....	337	345	382	376
	Orange..	276	270	433	441		Leaf.....	333	339	430	424
26.....	Brown..	323	325	421	431	26.....	Hat.....	336	344	407	412
	Gray....	331	337	453	446		Shoe....	346	342	415	403
	A.....	314	313	438	435			348	347	437	432
	AV.....	27	18	41	36			31	20	44	31

TABLE XXXII.

	B	C
Letters.....	+ 15	+ 37
Words.....	− 2	+ 33
Colours.....	+ 24	+ 101
Pictures.....	+ 39	+ 74

made, the times for the separate letters were averaged together, so that we get the average of thirteen determinations on each letter; these series were corrected in the usual way, the three reactions varying most from the corrected average being dropped.

As the determinations for the same letter were made at different times we find the mean variation larger than usual. Table XXXIII. gives besides the results obtained with aid of the sound-key, series made with aid of a second observer. The first observer simply named the letter as quickly as possible, and the second observer made the reaction on the sound in the manner above described. Mr. Wolfe acted as second observer; in the Table I have subtracted his reaction-time on sound (150σ) and his mean variation (10σ).

TABLE XXXIII.

	Second Observer. 9.—30. I.						Sound-Key. 5.—19. II.					
	B			C			B			C		
	R	V	R′	R	V	R′	R	V	R′	R	V	R′
A	398	25	405	458	43	440	430	18	396	462	38	476
B	444	30	436	471	53	457	414	26	406	418	30	413
C	466	36	477	450	22	453	417	29	417	421	28	424
D	421	18	417	454	31	454	394	51	400	412	15	411
E	400	11	402	445	9	447	396	30	397	425	28	424
F	432	31	434	442	21	446	405	30	412	414	26	420
G	453	31	446	483	24	474	402	48	395	427	14	426
H	435	20	441	423	13	417	356	20	352	429	26	422
I	395	26	403	433	25	429	394	24	394	449	36	451
J	408	29	417	473	44	472	399	42	410	417	21	415
K	432	18	438	474	34	463	395	25	401	415	27	409
L	412	20	418	463	47	457	393	22	397	427	34	423
M	421	44	400	435	16	425	389	21	395	418	26	422
N	429	38	419	453	19	460	384	32	390	415	36	422
O	410	15	404	440	32	436	395	19	392	411	15	409
P	459	64	442	462	23	455	392	19	398	395	15	393
Q	446	28	461	480	22	469	428	34	438	413	22	418
R	422	20	435	462	20	469	385	28	389	443	18	446
S	431	33	431	471	38	479	391	27	394	412	22	410
T	425	25	432	446	34	454	398	36	390	414	18	409
U	428	22	434	461	47	471	391	22	396	439	14	441
V	463	32	450	465	29	461	383	20	378	428	26	423
W	421	42	405	485	16	481	353	26	364	435	24	432
X	465	46	471	452	25	460	381	31	388	405	29	412
Y	433	20	446	501	26	493	405	44	415	458	33	463
Z	431	12	432	499	37	507	393	19	392	426	22	421
A	430		431	461		459	395		396	424		424
AV		28	14		29	16		29	19		25	17

We thus see that it takes the observers about four-tenths of a second to see and name (*i.e.*, read) a letter. In this connexion

results I have already published[1] should be considered. I there determined by two distinct methods the time it takes to see and name letters. In most of the experiments, however, the observer while seeing and naming one letter could begin to see and name the one or ones following, so that the processes overlapped and the times became much shorter, namely 279σ for B, 224 for C. The times were still further shortened (becoming 96σ for B, 89 for C) when the letters made words. Why B's times should be longer than C's under these circumstances and shorter for a single letter I do not know. We found in the preceding section that it took B 119, C 116σ to perceive a letter. Supposing the perception-time to be the same in both cases, B needed 143σ, C 176 to find the name belonging to a letter. It should be added that in later series of experiments B's time became shorter. This method of determining the relative legibility of the several letters has an advantage over that in the previous section in so far as all the letters occur in the same series; but it is greatly complicated by the fact that the time of pronouncing the several letters may be different, as also the motion registered by the sound-key or second observer.

Series were made on the German capital letters with the results given in

TABLE XXXIV.

	B				C			
	R	V	R′	V′	R	V	R′	V′
14. II.....	423	36	420	23	554	63	538	32
16.....	446	30	439	18	573	58	549	33
18.....	377	30	382	20	531	60	519	38
23.....	363	34	357	23	464	30	461	21
25.....	369	31	389	24	507	33	510	20
A.....	396	32	397	22	526	49	515	29
F.....	3				1			

Numbers of one, two and three places were further used, and the time it takes to see and name them was determined. I did not take numbers of more than three places, fearing that they might not be seen and read as wholes. The results are given in Table XXXV.; from which it will be seen that it took B 33, C 38σ longer to see and name a number of two places than of one, and B 57, C 47σ longer for a number of three than of two places.[2]

[1] *Phil. Studien*, ii. 4; MIND 41.

[2] See Friedrich, *Phil. Studien*, i. 1.

TABLE XXXV.

	One place.				Two places.				Three places.			
	R	V	R′	V′	R	V	R′	V′	R	V	R′	V′
B												
30. III.	318	14	317	9	357	26	358	16	413	39	417	20
2. IV.	316	28	312	16	344	18	343	10	381	25	377	15
A.	317	21	314	12	350	22	350	13	397	32	397	17
C												
30. III.	390	28	397	18	424	32	423	22	476	31	503	24
2. IV.	418	24	419	13	460	39	460	21	502	39	499	24
A.	404	26	408	15	442	35	441	21	489	35	501	24

The time it takes to see and name a word was determined in the same way. Experiments were made on long and short English and German words, 26 of each sort being taken. In the case of the short words I made thirteen series, and found the time for the separate words as with the letters (Table XXXVII.). On the long words only five series (130 determinations) were made, and the times for the separate words were not calculated (Table XXXVI.).

TABLE XXXVI.

	English.				German.			
	B		C		B		C	
	R	R′	R	R′	R	R′	R	R′
14. II.	493	484	451	450	419	409	501	498
16.	481	475	490	488	451	454	533	527
18.	447	440	451	457	424	418	507	500
23.	391	383	430	434	379	370	433	432
25.	391	378	431	431	381	376	473	475
A.	441	432	451	452	411	405	489	486
AV.	37	21	20	13	31	20	24	15

TABLE XXXVII.

	B		C			B		C	
5.—25. II	R	R′	R	R′	5.—26. II	R	R′	R	R′
Bond	393	397	407	405	Baum	367	367	423	423
Cause.....	395	394	423	428	Berg.....	382	385	414	417
Chair.....	398	390	415	411	Bild.....	366	365	428	424
Child.....	396	385	414	411	Brief.....	367	362	444	440
Death	397	399	410	405	Buch.....	377	381	441	443
Earth.....	405	414	409	406	Ding.....	380	379	432	435
Fact.....	358	355	389	385	Fluss	356	362	425	424
Faith	374	367	388	379	Form.....	350	354	407	409
Force..	359	362	371	373	Gold.....	378	385	452	450
Head	366	368	367	362	Haus.....	326	322	405	403
House.....	366	367	385	388	Jahr	362	354	455	454
King.....	393	389	414	408	Kind.....	392	401	444	450
Life.....	388	394	430	424	Kunst.....	397	400	456	461
Light.....	396	394	418	414	Land.....	381	386	440	441
Love.....	386	375	409	404	Licht	363	379	441	441
Mind	421	426	422	418	Mann.....	396	403	447	439
Name.....	402	401	405	410	Nacht.....	401	392	451	447
Plan.....	395	390	388	396	Recht	333	327	446	445
Ship.....	380	384	385	390	Stadt	399	402	451	449
Slave	407	413	409	402	Stern.....	417	413	436	432
Song.....	385	387	387	389	Teil.....	375	370	430	424
Style.....	431	435	435	442	Tisch.....	381	385	446	449
Time.....	381	388	411	408	Traum.....	366	372	453	454
Truth	380	372	426	424	Volk.....	348	346	429	428
World.....	381	370	411	408	Welt.....	341	340	447	445
Year.....	393	384	415	412	Zahl.....	374	381	459	469
A.....	389	388	405	404		372	374	439	438
AV	30	20	21	14		25	18	22	14

An examination of the Tables shows that it took longer (in English B 52, C 46σ, in German B 39, C 46σ) to see and name a long than a short word. In both cases, of course, the beginning of the motion was registered; so the time occupied in pronouncing the word does not come into consideration. We further learn that it takes longer (for short words B 17, C 35σ, for long words B 30, C 38σ) to see and name a word in a foreign than in one's native language.[1] Comparing the results here reached with those given in the foregoing section, we find that to name a short word in his native language B needed 104, C 114σ. We find further that B named a word in 39, C in 62σ less time than a letter.

[1] See Cattell, *Phil. Studien*, ii. 4; MIND 41.

This is not surprising; we are constantly reading and using words, much more than letters; so the association between the concept and the name has become closer and takes place in less time.

The same method was used to determine the time it takes to see and name a colour. The ten colours taken occurred two to three times in a series, and the times for the separate colours (13 determinations) were afterwards averaged together. Table XXXVIII. gives the times as measured with aid of a second observer, and as directly registered. The order of the colours is that of the average time needed to name them, beginning with the colour most quickly named.

TABLE XXXVIII.

	Second Observer 9.—30. I.						Sound-Key. 5.—25. II.					
	B			C			B			C		
	R	V	R′	R	V	R′	R	V	R′	R	V	R′
Blue	551	47	530	633	40	643	443	56	438	518	34	515
Green	535	59	539	663	25	658	433	36	440	539	29	532
Red	503	37	491	638	46	658	492	57	504	576	61	559
Black	641	82	618	589	34	583	473	41	464	515	54	505
Yellow	574	33	563	660	17	656	481	70	490	588	54	575
Pink	614	105	615	714	62	699	503	75	485	614	92	578
Violet	621	52	613	688	73	659	552	56	558	603	32	611
Gray	568	57	586	860	119	841	447	63	426	714	91	697
Brown	641	104	630	978	130	990	532	83	515	625	85	603
Orange	669	56	659	910	122	876	584	96	566	718	76	730
A	592		584	733		726	494		489	601		591
AV		63	39		67	42		63	42		61	38

These results are interesting and were not foreseen. We found in the preceding section that it takes less time to perceive a colour than a letter or word; we now find that it takes comparatively a very long time (B 286, C 400σ) to find the name of the colour. This was especially the case at first and for certain colours. The colour was recognised with ease, but the name could only be found (more especially by C) with great difficulty. The colours most frequently seen and named in our daily life, red, yellow, green, blue and black, were named with greater ease and in decidedly less time (B 61, C 150σ) than the other five colours, pink, violet, orange, gray and brown. In the case of these latter colours the time was considerably shortened by practice.

The twenty-six pictures already described were in like manner seen and named (by B in German, by C in English), the times for the several pictures (13 determinations) being given in the following Table.

TABLE XXXIX.

	Picture of an	B		C			B		C	
		R	R′	R	R′		R	R′	R	R′
14.—26. II.	Anchor	489	463	552	535	Leaf	497	497	578	567
	Bird	515	507	569	566	Moon	496	504	588	587
	Bottle	489	479	572	561	Picture	475	486	587	574
	Candle	493	494	563	552	Scissors	447	453	558	558
	Chair	498	510	539	534	Ship	445	438	493	486
	Cross	485	470	586	591	Shoe	437	430	492	493
	Eye	496	476	500	503	Star	481	488	496	498
	Fish	462	454	497	487	Table	486	496	544	547
	Flower	495	479	568	586	Teapot	499	486	612	600
	Glass	480	466	585	596	Tree	457	449	524	517
	Hand	484	476	500	490	Umbrella	466	472	567	556
	Hat	419	415	454	446	Watch	461	462	567	562
	Hatchet	469	454	526	513					
	Key	477	467	561	560	A	477	472	545	541
						AV.	46	30	40	25

We found in the foregoing section that pictures (and, we may assume, the objects themselves) can be seen in about the same time as colours; we now find that they can also be named in about the same time (by B in 251, by C in 278σ) as the colours most frequently used. The difference in time for the several pictures is interesting; both B and C named the picture of a hat in the shortest time; B required the longest time to name 'bird' and 'teapot,' C to name 'teapot' and 'moon'. It is an interesting fact that the picture of a chair can be recognised in less time than the word 'chair,' but that it takes over a tenth of a second longer to name it.

It will be useful to collect together certain of the results of these experiments. In the following Table I do not give to the thousandth of a second the averages of the determinations made, but what from the experiments seems to be the time it takes B and C to perceive and find the name of the objects we have been considering.

TABLE XL.

	B	C
Reaction-time for Light	150	150
Perception-time for Light	30	50
" " a Colour	90	100
" " a Picture	100	110
" " a Letter	120	120
" " a (short) Word	120	130
Will-time for Colours	280	400
" Pictures	250	280
" Letters	140	170
" Words	100	110

We have thus found the time it takes us to see and name the objects which we spend a great part of our life in seeing and naming. We have not been dealing with artificial processes or things outside the circle of our natural interests. If in the course of evolution, as is probable, the molecular arrangement of the nervous system becomes more sensitive and delicately balanced, we may suppose that the times taken up by our mental processes become shorter, and we live so much the longer in the same number of years. It will therefore be of great interest to make experiments such as these on the lower races, as well as on persons of different age, sex, occupation, &c.

V. *The Influence of Attention, Fatigue and Practice on the Duration of Cerebral Operations.*

We have seen that while the time of a reaction is somewhat lengthened when the brain cannot so well prepare itself, it does not vary greatly with different degrees of Attention. I have made similar determinations for cerebral operations in which complications have been added to the simple reaction-time. I chose as typical cases the time it takes to see a white surface and show this by a motion of the hand, and the time it takes to see and name a letter. On the one hand the observer tried by great concentration of the attention and effort to react as quickly as possible; on the other hand the impression was produced at irregular intervals (three-fourths to fifteen seconds), so that the brain could not be held in a maximum state of readiness.

We find, from Table XLI., under the two degrees of attention or preparation a difference in the times of seeing and reacting on the white surface of 75σ for B, 15 for C; in the time of seeing and naming a letter 29σ for B, 25 for C.

TABLE XLI.

	Concentrated.				Distracted.			
	B		C		B		C	
	R	R′	R	R′	R	R′	R	R′
	White Surface.							
4. IV	192	194	236	234	333	321	273	278
5.	196	193	235	237	250	233	256	254
6.	186	191	230	231	244	234	234	229
7.	192	194	246	249	239	239	246	248
A	191	193	237	238	266	257	252	252
AV	13	6	13	10	38	23	16	9
	Letters.							
4. IV	334	335	395	398	387	388	441	442
	336	333	397	402	371	366	403	411
5.	335	337	404	410	373	377	432	435
6.	333	336	395	397	343	350	422	418
7.	331	333	410	408	340	339	427	426
A	334	335	400	403	363	364	425	426
AV	29	20	21	13	33	20	26	16

As I have given throughout this paper the dates on which the series were made and have not omitted any series, the results of continued Practice can be studied to advantage. B and C had previously had considerable practice in making simple reactions, but none in the other processes here considered. In the twenty series of reactions on light (Table I.) made during a period of six months, no reduction in the time is to be noticed. B's reaction-time was however shorter in 1884-5 than in 1883-4, as can be seen from Table VI., where his times, especially for light, are considerably longer than C's. I repeated at the close of the investigation the determinations made at the beginning in which the observer reacted on one of a number of colours, letters or words (the results are given in Tables XIX., XXIV., XXVII.), and found that the times had become shorter. I give the decrease in time.

	B	C
Colours	28	20
Letters	50	25
Words	54	35

As I have already mentioned, the time of naming the colours and pictures became shorter through practice. In some cases where the attention was distracted the brain accommodated itself to the changed conditions. It can be stated as a law that the times of cerebral operations become shorter as they become more automatic, but that a limit is reached beyond which further practice has little or no effect.

The investigation was concluded in April; in July, after an interval of three months during which no reactions were made, the times of the more important processes were again measured. The Table gives the results of five series of simple reactions on light and sound, of five series in which the observer showed by a motion of the hand that he had perceived a white surface, a letter and a colour, and of three series in which he perceived and named a letter, a word and a colour. The increase or decrease of the time is given in the column headed Df.

TABLE XLII.

	B					C				
	R	V	Df	R′	V′	R	V	Df	R′	V′
Light....	139	12	−10	140	8	167	13	+17	167	9
Sound...	122	7	− 3	121	5	141	9	+16	139	6
White...	212	12	+ 1	211	6	254	13	+13	254	8
Letter...	305	22	+19	304	14	309	26	− 3	307	18
Colour...	258	22	− 1	256	17	289	24	− 4	284	15
Letter...	354	25	−41	353	17	425	22	+ 1	428	14
Word....	331	17	−58	330	12	410	20	+ 5	410	14
Colour...	402	33	−92	400	23	609	71	+ 8	600	50

We now come to the effects of Fatigue. These, like the effects of attention, have been greatly overestimated, experimenters having made but few reactions in a series or at a sitting, fearing lest the observer should become fatigued and the times unduly long. In order to determine the influence of fatigue in successive reactions, I took thirty series of simple reactions on light and averaged all the first reactions (as also the mean variation of these reactions) together, all the second reactions, and so on through the twenty-six reactions of which the series was made up. In the same way I took two hundred series where the subject had to react (with the hand) after distinguishing an impression, and averaged all the first, second, &c. reactions together. The impressions were different in the different series, but of course the same throughout each series. In these series only thirteen determinations were made, but twenty-six mental processes took place, it being as fatiguing to see that the object was not there and keep from reacting, as to distinguish the object and react.

TABLE XLIII.

	B		C			B		C			B		C	
	R	V	R	V		R	V	R	V		R	V	R	V
I.....	136	18	139	15	XIV ...	147	9	151	10	I.....	277	30	306	29
II.....	146	14	155	13	XV.....	147	9	151	8	II.....	287	25	308	22
III....	144	11	150	9	XVI ...	149	12	148	8	III....	294	25	308	23
IV.....	145	16	149	10	XVII..	152	12	154	12	IV.....	298	22	316	28
V.....	143	9	149	10	XVIII.	152	8	152	10	V.....	297	25	314	23
VI....	142	13	149	13	XIX ...	151	9	154	13	VI....	300	25	317	22
VII...	147	10	151	13	XX.....	148	10	151	12	VII...	292	21	318	24
VIII.	148	10	150	11	XXI...	150	13	146	9	VIII.	298	23	319	23
IX....	155	13	149	7	XXII..	152	12	150	10	IX....	299	20	319	23
X.....	145	9	151	9	XXIII.	147	8	148	12	X.....	297	23	322	24
XI....	143	13	147	9	XXIV.	152	13	144	10	XI....	297	23	319	22
XII...	154	14	147	13	XXV...	150	13	144	11	XII...	293	20	322	23
XIII.	153	16	152	11	XXVI.	150	15	150	10	XIII.	295	22	317	23
A.....						148	12	149	11		294	23	316	24

It will be seen that, though the difference is not great, the first reactions of a series are the shortest. It seems that in the first experiments the observer involuntarily strains his attention more, and so gives shorter times. This is the more marked the less automatic the process is; that is, with the white light than in the simple reaction, and in the case of B than in the case of C. The further course of the series shows no lengthening in the times or increase in the mean variation; so the brain is not considerably fatigued by making (or refraining from making) twenty-six reactions in succession.

In order further to investigate the effects of fatigue, I made extended series of experiments in which 1950 reactions were made in succession, the observer reacting almost continuously from early in the morning until late into the night. Three series (78 reactions) were made with light, then three series (39 determinations, but 78 mental processes) in which white light was distinguished and reacted on, then three series in which letters were seen and named, then two series in which associations were made, lastly three series of reactions on sound. This entire combination of series was repeated six times. The experiments were begun both days at 7·30 a.m. and were concluded in the case of C at 1·30 a.m., in the case of B at 11 p.m., short pauses being made for meals. One series of each variety was made the following morning and again in the evening; in the case of C a further set of series the day after. In the Table I give the average time and mean variation of the first set of series, afterwards the increase or decrease as compared with these. I do not take up space to give the corrected series, as they scarcely differ from the others.

TABLE XLIV.

		Light.		White Surface.		Letters.		Assoc.		Sound.	
		B									
31. III.	7·30 a.m....	157	12	198	21	344	25	733	103	139	9
	9·40 „	− 1	− 1	− 5	− 4	+ 10	+ 2	− 98	− 17	− 3	− 1
	1 p.m....	− 14	− 2	+ 9	− 4	− 7	+ 9	− 59	− 11	+ 11	+ 10
	2·50 „ ...	− 10	− 3	+ 9	+ 4	+ 4	+ 1	− 2	− 8	− 7	− 2
	6·55 „ ...	+ 1	− 2	+ 34	− 3	+ 12	+ 6	− 81	− 39	+ 3	+ 2
	8·50 „ ...	+ 5	+ 1	+ 20	− 2	+ 37	+ 5	− 228	+ 121	+ 10	+ 1
1. IV.	8·30 a.m....	+ 17	− 2	− 10	+ 1	+ 21	+ 9	+ 83	+ 2	− 16	− 2
	8 p.m....	+ 7	+ 3	+ 2	− 5	+ 1	+ 10	+ 153	+ 68	− 2	+ 5
		C									
26. III.	7·30 a.m....	156	10	247	12	429	23	827	125	144	13
	10·55 „ ...	+ 10	+ 3	− 17	+ 4	− 8	− 4	+ 9	+ 8	+ 2	− 3
	2·40 p.m....	+ 28	+ 5	+ 1	+ 9	+ 9	0	+ 12	+ 43	+ 15	+ 1
	7·20 „ ...	+ 19	+ 1	− 10	+ 7	+ 19	− 3	+ 58	+ 5	+ 15	+ 3
	9·20 „ ...	+ 33	+ 7	+ 6	+ 9	+ 37	+ 3	+ 163	+ 23	+ 19	− 4
	11·40 „ ...	+ 34	+ 8	+ 2	+ 4	+ 30	0	+ 111	+ 10	+ 11	0
27. III.	8·30 a.m....	+ 27	+ 1	+ 6	+ 7	− 3	+ 5	+ 19	+ 7	wanting	
	8 p.m....	+ 20	+ 5	− 2	+ 2	+ 11	− 3	− 12	− 41	+ 23	− 2
28.	8·30 am....	+ 25	+ 12	− 1	+ 5	− 5	− 3	+ 42	+ 44	− 6	− 1

The first result to be noted from the Table is the very slight effects of fatigue; in no case is the time lengthened more than a couple of hundredths of a second, and the mean variation is but little increased. We reach the unexpected result that the processes which are the most automatic (naming the letters, and C's simple reaction-time) are the most affected by fatigue. The determinations made on the following day show that B had recovered from all fatigue; in the case of C, however, the brain substance concerned in the simple reaction seems to have been so far exhausted that his reaction-time remained abnormally long for two days.

I think these experiments show that it is possible to apply scientific methods to the investigation of mind. We have determined the times required for those processes which make up a great part of our mental life, and found these times to be constant; they are no more arbitrary, no less dependent on fixed laws than, for example, the velocity of light. I shall soon print an account of experiments going a step farther and determining the times of mental processes more removed from psycho-physical operations having to do with sensation and motion.

THE PERCEPTION OF SPACE BY DISPARATE SENSES.

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Introductory.

In the philosophic doctrine of "common sensibles"—the *κοινὰ αἰσθητὰ* of Aristotle—the general problem of the relation of space-conceptions to the senses which furnish them receives its first notice. Hobbes regards motion, rest, size and shape as notions common to sight and touch. Locke names as a distinct class of simple ideas those which owe their origin to two senses; thus space, extension, figure and motion are made common to sight and touch. Either sense gives an adequate idea of space; and the two ideas are in perfect agreement. Berkeley,[1] however, held that these two notions of space were distinct and heterogeneous; that they were regarded as one because they were constantly joined in experience. By a proposal of Molyneux the discussion was brought to an issue by testing the space-ideas of persons born blind and restored to sight by a surgical operation. Such persons are unable to identify the object now seen with the object formerly touched until this identification has been slowly learnt by experience. In this process touch is the teacher and sight the scholar.[2] Mr. T. K. Abbott[3] opposes Berkeley and regards each sense as having its own space-idea, which is little influenced by association with another. Prof. Stumpf[4] ascribes some space-relations to each of the five senses, and regards the resulting conception as essentially innate and single. A more recent writer, Dr. E. Montgomery,[5] supposes an organically evolved pre-established harmony between the several space-senses. He assumes a central organ which gives sensations their spacial value, and puts the matrix of tactile space in the optic thalami, of the knowledge of the position of our body in the cerebellum, of visual space in the corpora quadrigemina.

[1] "It is a mistake to suppose that we see and feel the same object."

[2] One patient did not realise the impressions of his new sense until "he perceived the sensations of what he saw in the points of his fingers as if he really touched the objects". Another was quite confused by not being able to combine sight and touch. "I cannot tell what I do see." "I am quite stupid."

[3] *Sight and Touch*, London, 1867.

[4] *Ueber den psychologischen Ursprung der Raumvorstellung*, Leipzig, 1873.

[5] "Space and Touch," in Mind 38, 39, 40.

Mr. Spencer and especially Prof. Bain lay most stress on the influence of the muscular sense in forming space conceptions.[1]

In order to approach the problem by experimental methods it will be necessary to define accurately such terms as sight, touch, motion. The following classification, though provisional and imperfect, will perhaps be found convenient. We can obtain the notion of extension—

I. By the stimulation of a definite portion of a sensitive surface,

(1) Of the retina (where the distance of the stimulating object must be inferred);

(2) Of the skin,

(*a*) By the application of a pair of points, leaving the intermediate skin unstimulated, or (*a'*) stimulating it by the application of a straight edge,

(*b*) By the motion of a point along the skin (see MIND 40, pp. 557 ff.);

[(*a*) and (*b*) may be contrasted as simultaneous and successive.]

II. By the perception of distance between two movable parts of the body, *e.g.*, between thumb and forefinger;

III. By the free motion of a limb, *e.g.*, the arm.[2]

The operations to be known as reproducing judgments by the *Eye*, the *Hand* and the *Arm*, are respectively—judging lengths by fixating the eyes upon them without motion of the eyeball, a form of I. (1); judging distances between thumb and forefinger, a form of II.; and judging distances by guiding a pencil over them with a free arm-movement, a form of III.

The problem was to compare the judgments of linear extension made by these three senses, and to determine their relative accuracy. The method consisted in presenting a definite length to one of these senses of the subject, who was then required to adjust a second length equal to the first by the use of the same or of another sense. The judgments were confined to lengths between 5 and 120 mm. The lower limit is set by the inconvenience of seeing, drawing and measuring such small lines; the upper by the greatest 'span' between thumb and forefinger, as

[1] For an account of this whole subject see *Common Sensibles* by Dr. Theodor Loewy, Leipzig, 1884; and *Sight and Touch* by T. K. Abbott.

[2] To this list ought perhaps to be added the perception of distance by a passive moving of the body, as in riding. (See Mach, *Bewegungs-Empfindungen.*) In all the above processes variations may be made. In I. (1) motion of the eyeball may be admitted or excluded; direct or indirect vision with one or with both eyes. In II. one part may be movable, the other not, as in estimating distances between the finger and forehead. In the variation used, the sensations are due to the tensing of muscles and skin.

well as by the longest line distinctly visible without motion of the eyeball. More direct methods of testing the relative fineness of these senses and of their memory for absolute lengths were also employed. In several of the operations the two sides of the body were involved, and it became necessary to study the effect of this circumstance.

Method and Apparatus.

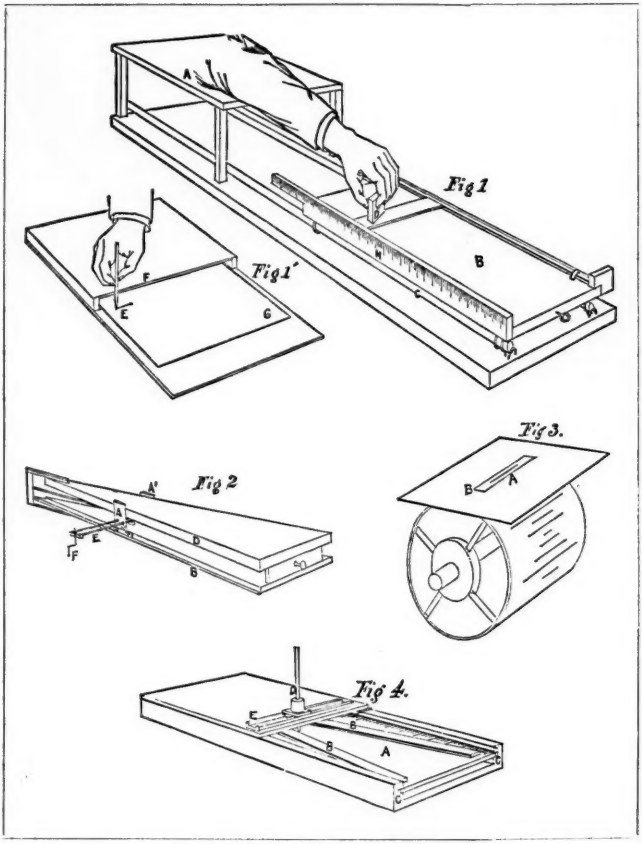
The sense which receives the linear impression is termed the *receiving sense*; that which expresses it by a length that is judged to be equal to the first, the *expressing sense.* If, for example, I look at a line and (without seeing my arm) draw a second line that seems equal in length to the one looked at, I am expressing in terms of motion an impression received in terms of sight, or reproducing sight by motion, the eye by the arm. Unless otherwise stated the operations are to be considered as simultaneous, the receiving and expressing senses acting at the same time, and the attention probably flitting from one to the other. The method and apparatus are equally suitable for successive judgments, which were made in some cases to obviate the use of both sides of the body. From a description of the method by which (1) an impression was received and (2) expressed by each sense, it will be easy to infer the method of reproducing any one of the three senses by itself or by any other.

A. *Receiving by the Eye.* A series of lines varying in length from 5 to 120 mm. were drawn upon cardboard and this attached to a horizontal cylinder (Fig. 3). Above this was a screen, through a slit in which any of the lines could be made to appear. The lines were seen perpendicularly to the axis of the eyes, and from above at an angle of about 30°.

B. *Receiving by the Hand.* Any one of a series of wooden blocks, 1½ inches wide and varying in length from 5 to 120 mm., with slips of glass cemented on each end to ensure equality of surface and temperature, was grasped in a convenient position between the thumb and forefinger of either hand. This gave a definite sensation of a length 'spanned'. To ensure regularity in the operation, the block (D, Fig. 1) was mounted on a stand, and the latter fastened in the grooves of the car (B, Fig. 1).

C. *Receiving by the Arm.* The apparatus used (Fig. 4) is called the Motion-triangle, because the amount of motion is regulated by the distance between two ledges set in the form of a triangle, the motion being parallel to its base. The hand grasps a cork carriage (D), through which the point of a glass pencil projects downward, to be stopped at each end of its course by the ledges (B B). Any desirable length of movement is obtained by simply sliding the board (A), upon which the ledges are fixed, in or out, along the grooves (C C), the length being indicated on a scale attached to the board. The base of the triangle is 6 inches

in length, its altitude 20 inches. The slide and the base of the carriage were made of glass and kept frictionless by the use of oil.



ILLUSTRATIONS OF THE APPARATUS.

Fig. 1 represents the method of receiving an impression by the Hand, in this case the left hand; the impression thus received is expressed by the right hand Fig. 1′ at E, by a free movement of the arm. The eyes of course are closed. A, the platform upon which the arm rests; B, the sliding car, moving upon glass tubes C, and carrying the block D mounted on a stand. The pencil, guided along the straight edge F, draws a line E on paper tacked upon a board G which can be moved under F.

Fig. 2. The Span-triangle, to be placed upon the car B (Fig. 1). A, A′, carriages moving on rollers along the rods B and against the glass edge D; E, a pair of rods projecting through the carriages A A′ and guided in the centre by a wire, seen near the apex; F, a bent wire recording on the scale H (Fig. 1).

Fig. 3. For receiving by the Eye. By revolving the cylinder the lines are seen at A, through the slit B in the screen.

Fig. 4. The Motion-triangle. A, a board movable along the grooves C and C, and carrying a scale; B B, two wooden ledges set in the form of a triangle; D, the carriage moving along the glass slide E, and its projecting point striking against B B, seen below.

A′. *Expressing by the Eye.* Parallel to the base of a triangle (also 6 by 20 inches) were drawn a series of lines each differing in length from its neighbour by 1 mm. Each line could be referred to by a letter marked at one end; and the operation consisted in selecting a line that seemed equal to the impression received. This may be called the Sight-triangle. As this method proved to be somewhat difficult and restricted the judgment, especially in the case of short lengths, it was supplemented by marking off on ruled paper as much of the ruled line as seemed equal to the impression received. The hand did not move over the line, but indicated by a stroke the desired length.

B′. *Expressing by the Hand.* The apparatus (Fig. 2) is called the Span-triangle, and like the others is 6 by 20 inches in size. It consists of an upper part (D) and a lower part (B), joined at the apex and at the base, with an interval of about $\frac{3}{4}$ inch between the two. A pair of brass carriages (A, A′), triangular in shape and complementary to half of the large triangle, move on rollers along the rods (B) and the glass slip (D). A pair of rods (E) projecting on either side (through the interval between the two parts) is guided by a wire stretched from the apex to the middle of the base of the triangle, and keeps the carriages parallel and opposite to one another. An indicator (F) records the distance between the carriages at any point, upon a scale (H, Fig. 1). The carriages are grasped between the thumb and forefinger and adjusted by an easy motion up or down.

C′. *Expressing by the Arm.* A duplicate of the Motion-triangle above described is used, and, when the subject receives with one arm and expresses with the other, is regulated by the operator at the command of the subject. A handier method (especially applicable in successive judgments) is shown in Fig. 1′. It consists in drawing, with eyes closed, a line (E) along a straight edge (F). By moving the board upon which the paper is attached after each line, a series of lines is obtained.

Results.

In judging that a length perceived by the Eye is equal to another length perceived either by the Eye, Hand or Arm, there will be an error. The problem consists in tracing the nature and extent of this error.

I. When the receiving and expressing senses are the same,

(1) *If the Eye is both receiving and expressing sense, small lengths will be underestimated, and large lengths exaggerated*, the point at which no error is made being at about 38 mm. [Fig. 5, 1-1];

(2) *If the Hand is both receiving and expressing sense, small lengths will be exaggerated, and large lengths underestimated*, the 'indifference-point' being at about 50 mm. [Fig. 5, 2-2];

(3) *If the Arm is both receiving and expressing sense, all lengths* (within the limits of the experiments) *will be exaggerated* [Fig. 5, 3-3].

These results are expressed graphically by the three curves in the centre of Fig. 5.

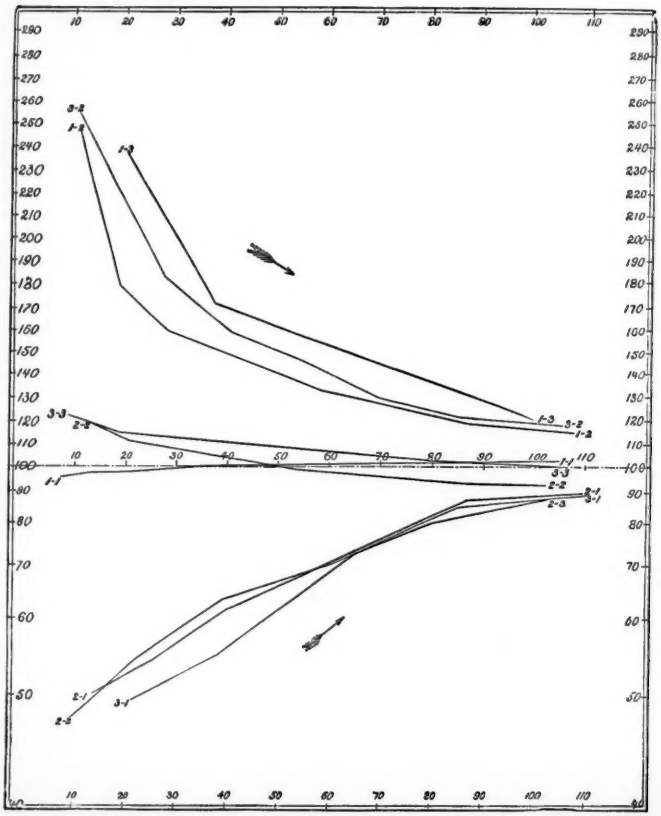


FIG. 5. CURVES SHOWING THE ERRORS IN REPRODUCING SPACE-IMPRESSIONS.

The error is measured by ordinates above or below the broken central line, in percentages as indicated at the sides of the diagram.

The abscissæ measure in millimetres the original length to be reproduced, as indicated upon the broken line as well as upon the top and bottom. The curves follow the direction of the arrows.

1 always indicates the Eye, 2 the Hand, and 3 the Arm.

1-1, the curve for receiving the impression and expressing the judgment by the Eye.

2-2, the curve for receiving the impression and expressing the judgment by the Hand.

3-3, the curve for receiving the impression and expressing the judgment by the Arm.

2-1, the curve for receiving by the Hand and expressing by the Eye.

3-1,	„	„	the Arm	„	the Eye.
1-2,	„	„	the Eye	„	the Hand.
3-2,	„	„	the Arm	„	the Hand.
1-3,	„	„	the Eye	„	the Arm.
2-3,	„	„	the Hand	„	the Arm.

Each curve represents the average of experiments upon from three to seven individuals and the result of about 1800 observations.

The distinguishing characteristic of a curve is its direction; whether it proceeds from below the line upward, or from above the line downward. Such features as the extent of the error, or the point at which, if at all, the central line is crossed, show great individual differences. It is only when (as in the above described curves) the absolute error is small throughout, that individual differences appear as curves of opposite direction. The average error in the Eye-judgments was only 3 per cent., in the Hand-judgments 9 per cent., in the Arm-judgments 10 per cent.

When either the Hand or the Arm acted as both the receiving and expressing sense, the two sides of the body were used at once. What now would be the effect of interchanging the hands, making the receiving hand in the first case the expressing hand in the second? If it were only to alter slightly the extent of the error, it would indicate an accidental variation or a slight superiority of one hand. If, however, this change were to reverse the former result, it would indicate a lack of symmetrical correlation of the two sides of the body. In point of fact the latter is the result. When the *right* Hand is the *expressing* hand, the curve agrees with the curve 2-2 (Fig. 5); when the *left* hand is the expressing hand, the curve is *irregular* and *below* the central line. When the *left* Arm is the *expressing* arm, the curve agrees with the curve 3-3 (Fig. 5); when the *right* arm is the expressing arm, the curve is *irregular* and *below* the line. The next question is, Which of these two curves is to be preferred? It is answered thus: If instead of using both hands simultaneously, the same hand were used successively, and it were found that the little difference resulted from interchanging the hands (or arms), the curve for that hand

(or arm) would be preferred which agreed with the results of the successive judgments. By this mode of reasoning, the curves for the *right hand* and the *left arm* as the expressing senses were preferred.[1] Another method of showing that the phenomenon is due to bilateral asymmetry of function, is to draw simultaneously lines with each hand, the attempt being to make the lines equal. Here as before the left arm draws the larger line, the error being slightly less when the lines are drawn towards than away from the body.

The conclusions above discussed may be summarised thus:—

When the same sense acts as the receiving and the expressing sense, the error is small (and the process easy). In operations involving the use of both sides of the body, an interchange of the function of the two sides reverses the results; when one hand alone is used in successive judgments, no such reversal takes place. The preferred Hand in span-sensations is the right; the preferred Arm in motion the left. The error of the Eye is less than that of the Hand; the error of the Hand slightly less than that of the Arm.

II. When the receiving and expressing senses are different,

(1) *If the Eye is the expressing sense, and*
(a) *the Hand the receiving sense,*

All lengths are greatly underestimated, the error decreasing as the length increases [Fig. 5, 2-1]. That is, if you attempt to mark off or select a length by the eye equal to the distance between your thumb and forefinger, the selected lengths will be too short; in case of small distances only about one-half the real length. The lines thus selected varied from about 48 per cent. to 88 per cent. of the true distance between thumb and forefinger the average being about 65 per cent.[2]

If the Eye is the expressing sense, and
(b) *the Arm the receiving sense,*

All lengths are greatly underestimated, the error decreasing as the length increases [Fig. 5, 3-1]. That is, the attempt to mark off or select by sight a line equal to the space moved over by a free arm movement will result in selecting or marking off much

[1] The successive judgments were made by the Hand, by first grasping a block between thumb and forefinger and then adjusting the carriages of the Span-triangle, to match the block felt; by the Arm, by attempting to draw (with eyes closed) the second of a pair of lines equal to the first, using the apparatus shown in Fig. 1′. In both these cases it makes little difference which hand or arm is used. All those experimented upon were right-handed.

[2] The lines were selected on the Sight-triangle or marked off on ruled paper, the impression being received by the right or the left hand. By these four methods a length of 15mm. was reproduced by lines 46 per cent., 36 per cent., 37 per cent. and 34 per cent. of the real length; of 110 mm. by lines 84 per cent., 80 per cent., 87 per cent. and 88 per cent. of the real length. The close correspondence of these numbers is an indication of the regularity of the processes involved.

too short a line. The error varies within about the same limits as when the hand acts as the receiving sense.

By combining the two conclusions we see that—

If the Eye is the expressing sense all lengths are greatly underestimated, the error decreasing as the length increases. This is expressed on Fig. 5 by the fact that the two curves 2-1 and 3-1 are close together throughout.

(2) *If the Hand is the expressing sense, and*
(a) *the Eye the receiving sense,*

All lengths are greatly exaggerated, the error decreasing as the length increases [Fig. 5, 1-2]. That is, the attempt to hold the thumb and forefinger as far apart as the length of a line seen by the eye will result in holding the thumb and forefinger too far apart, the distance being more than double the true length in case of short lines. On the average, the lines were reproduced by distances 144 per cent. of their true length.

If the Hand is the expressing sense, and
(b) *the Arm the receiving sense,*

All lengths are greatly exaggerated, the error decreasing as the length increases [Fig. 5, 3-2]. That is, the attempt to hold the thumb and forefinger as far apart as the space moved over by a free arm movement (of the other arm) will result in holding the thumb and forefinger too far apart.[1] On the average, movements were reproduced by distances 168 per cent. of their true length.

By combining the two results last obtained we see that—

If the Hand is the expressing sense, all lengths are greatly exaggerated, the error decreasing as the length increases. This is expressed on Fig. 5 by the close correspondence of the two curves 1-2 and 3-2.

(3) *If the Arm is the expressing sense, and*
(a) *the Eye the receiving sense,*

All lengths are greatly exaggerated, the error decreasing as the length increases [Fig. 5, 1-3]. That is, the attempt to move over a space equal to the length of a line seen by the eye will result in moving over much too large a space. On the average, a line will be reproduced by a space 185 per cent. of its true length.

If the Arm is the expressing sense, and
(b) *the Hand the receiving sense,*

All lengths are greatly underestimated, the error decreasing as the length increases [Fig. 5, 2-3]. That is, the attempt to move over a space equal to the distance between thumb and forefinger (of the other hand) will result in moving over much too

[1] It is to be noted that although both sides of the body are involved in this operation, it makes little difference whether the right side acts as the receiving sense and the left as the expressing sense, or *vice versâ*.

small a space.[1] On the average, the distance between thumb and forefinger will be reproduced by a movement 68 per cent. of its true length. It is not possible to combine the last two statements, for the substitution of Eye for Hand as the receiving sense changes the error from an underestimation to an exaggeration.

A comparison of the conclusions thus far reached will bring to light a few general laws applicable to all three senses.

A. The error decreases as the length (to be reproduced) increases.

This means that (within the limits of the lengths experimented upon) a larger length is reproduced more accurately than a smaller one. It is expressed in Fig 5 by the fact that the direction of all the curves is towards the central line, following one or other of the arrows.[2]

B. If reproducing one sense by another results in an exaggeration (or underestimation), then reproducing the second sense by the first will result in an underestimation (or exaggeration) to about the same extent.

In attempting to move over a space equal to the length of a line seen I move over much too large a space, and when I select by sight a line equal to a space moved over by my arm I select much too short a line. Thus the curves expressing the space-relations of the three senses are grouped in pairs [Fig. 5, 1-2 and 2-1; 1-3 and 3-1; 3-2 and 2-3], one of each pair being above the central line, the other (in which the receiving and expressing senses have changed places) below it. This law confirms one's *à priori* expectations on the assumption that the processes involved are rational and regular; for to say that the eye 'draws' a smaller line than the arm is the same as to say that the arm draws a larger line than the eye. A result of this law is that in the three pairs of operations, Eye to Hand and Hand to Eye (1-2 and 2-1), Eye to Arm and Arm to Eye (1-3 and 3-1), Arm to Hand and Hand to Arm (3-2 and 2-3), the mean proportional[3] between the exaggerated reproduction by the first and the underestimated reproduction by the second of each pair of operations will give

[1] The foot-note on page 547 is equally applicable here.

[2] The law is applicable to the curves in which the receiving and expressing senses are the same, if we measure the error by ordinates upon a horizontal line drawn through the origin of the curve.

[3] Not the 'mean' but the 'mean proportional,' because the same absolute error is a greater error as an underestimation than as an exaggeration. Doubling a length is as far from the truth as halving it; but there is an error of 100 per cent. in the first case and of 50 per cent. in the second. The two appear alike when we compare the exaggerated reproduction with the reciprocal of the underestimated reproduction. To make the curves above and below the central line (Fig. 5) absolutely comparable as they stand, the percentages below the central line are plotted in terms of their

about the real length. If (1) without looking I take a book between my thumb and forefinger and mark off by sight a length that seems equal to the thickness felt, and then (2) looking at the thickness of the book, measure the distance between thumb and forefinger that seems equal to the thickness as seen, the mean proportional between the two results will give about the true thickness of the book.

C. A third rather peculiar law remains to be noticed. The processes involved in the above-described experiments can be represented thus: A length presented to the receiving sense makes a certain impression on my brain-centre; the problem then is to reproduce the objective stimulation which shall give me an equivalent sensation. The two operations being simultaneous, the sensations can be compared and the judgment corrected until they agree. When the receiving and expressing senses are the same, the comparison is between homogeneous sensations, involving one brain-centre; the operation is easy and the error small. When the expressing sense differs from the receiving sense, heterogeneous sensations must be compared, involving two brain-centres; a difficult operation with a large error. The large error seems to be due to a looseness of association between heterogeneous space-centres; it is a path of high resistance. Why this error is in the direction in which it is, and not in the opposite direction, depends on some fundamental relation of the senses involved, still to be discovered. For the present, the fact that the same objective spacial stimulation has a different value for the several space-senses is to be emphasised. Perhaps the following method will shed some little light on the question. Which of the following changes can be made with a minimum alteration of the results: (1) Substituting one receiving sense for another, leaving the expressing sense unchanged? Or (2) substituting one expressing sense for another, leaving the receiving sense unchanged? If the first, then the error derives its characteristic more from the expressing sense; if the second, from the receiving sense. In point of fact the generalisations already formulated show that the expressing sense gives the characteristic properties to the curve, for it was seen that with the Eye as expressing sense an underestimation, with the Hand or Arm as expressing sense an exaggeration takes place, it being immaterial whether the eye, the hand or the arm acts as receiving sense. As a peculiar exception [1]

reciprocals. The average reproductions of the exaggerating curves are 185 per cent., 168 per cent. and 144 per cent. respectively; of the underestimating curves 68 per cent., 65 per cent. and 59 per cent., whose reciprocals are 147 per cent., 154 per cent. and 170 per cent. This justifies the clause "to about the same extent" in Law B.

[1] The peculiarity of the exception is that it is a necessary one. Law B requires the curves for reproducing the arm by the hand and the hand by the arm to be on opposite sides of the central line, while Law C requires them to be on the same side; *i.e.*, whenever expressing by one sense causes the

to this rule we found that with the Arm as expressing sense and the Eye as receiving sense, an exaggeration, but with the Hand as receiving sense, an underestimation takes place.

Another mode of experimentation touches upon the problem in a somewhat different manner. The subject, instead of having an impression presented to one of his senses, attempts to express his mental recollection of some absolute measure (*e.g.*, a certain number of inches), by selecting a line, a distance between thumb and forefinger, or a space moved over by the arm, that seems equal to the mental recollection. In so doing the eye 'creates' its inches about 10 per cent. too short; the hand and arm about 20 per cent. too long in small lengths, the excess decreasing as the length increases. The smallness[1] of these errors seems best accounted for by assuming that in 'creating' inches by the Eye I use the recollection of my visual inch; by the thumb and forefinger, of my span-inch; by the arm, of my motion-inch. The operation would closely resemble that in which the receiving and expressing senses are the same; accordingly, when the sense used is the Eye we should have an underestimation, when the Hand or Arm an exaggeration, which is exactly the case. Our conclusions then are (1) *that the memory for absolute measurements is not quite accurate, the order of accuracy being Sight, Span, Motion;* (2) *that the operation probably consists in matching the reproduction with the homogeneous mental recollection;* (3) *that the Visual inch is too short, the Span- and Motion-inch too long.* These conclusions evidently favour the point of view of law C.

D. Finally, a comparison of the error in reproducing by the same and by a different sense leads to the very important conclusion that the former operation is an accurate and easy one, the latter an inaccurate and difficult one. The difficulty manifests itself as a feeling of discomforting uncertainty and lack of confidence in one's judgments, and a great susceptibility to fatigue. The connexion between two senses seems to be a loose one.

Relative Accuracy of the Senses.

Three indications of the relative accuracy of the three senses have already been given. (1) When the receiving and expressing

same kind of error as expressing by another, this contradiction between the two laws must take place. In this case Law C is violated and Law B maintained.

[1] A further indication of the regularity of these operations was obtained by requiring the subject to judge in inches the lengths of certain lines, distances and spaces by Sight, Span and Motion. If in expressing inches there is an exaggeration (or underestimation), then in judging inches there must be an underestimation (or exaggeration); and this is really the case. To show the effect of practice in one's knowledge of absolute lengths, some carpenters were tested and found to give more accurate and confident judgments than others. This superiority was confined entirely to Sight.

senses are the same, the error of the Eye is smaller than that of the Hand, and of the latter slightly smaller than that of the Arm; (2) when the receiving and expressing senses are different, the same holds true, if we regard the expressing sense as the characteristic one; (3) in expressing and judging inches, the order of accuracy is also Eye, Hand, Arm; the two last being nearly alike.

Prof. Bowditch and Mr. Southard[1] have compared Sight and the Motion-sense by placing a small disc upon a table and requiring the subject (with eyes closed) to guide a pencil to the disc. In one set of experiments the knowledge of the position of the disc was obtained by glancing at it, in another set by placing it in position with the hand. They find that the error, *i.e.*, the distance between the disc and the point upon which the pencil was placed, is least when the eye in direct vision is the sense used, and greatest when the opposite hand is used, it being intermediate if the disc and the pencil be placed by the same hand. The effect of the time-interval between placing and finding the disc is about the same in each method, the most accurate adjustments being made with an interval of two seconds.

The following experiments were designed to obtain the ratio of erroneous judgments made in deciding which of two slightly different lengths was the longer, when the decision was made by the eye, by the hand and by the arm. For testing Sight two groups of lines, with three lines in each group, were drawn and fastened to the cylinder (Fig. 3) to be viewed successively through the slit in the screen. The lengths of the first lines in the groups were 25 mm. and 100 mm. respectively, the second differing from the first by $\frac{1}{50}$ and the third by $\frac{1}{100}$ of the entire length. For testing the sense of Span two precisely similar groups of blocks were constructed and mounted on the car (B, Fig. 1), to be felt successively by thumb and forefinger. For testing the Motion-sense a delicate Motion-triangle was devised and the points recorded on the scale at which the desired differences were reached. An observation was made as follows:—For example, we are testing the eye, using the larger lengths (100 mm.) and a difference of $\frac{1}{50}$. The subject then either (1) sees a line 100 mm. long, then one 98 mm. long, and again one 100 mm. long, or (2) sees a line 98 mm. long, then one 100 mm. long, and again one 98 mm. long. The first and third lengths are always alike, the middle length is either shorter as in the first case, or longer as in the second, and the subject is to decide whether the middle length was shorter or longer. By having two changes—one an increase, the other a decrease—in each experiment, the well-known difference in sensibility for these two kinds of change is avoided; while the chance of a correct answer is increased. In addition to its correctness or falsity, the confidence felt in the judgment given was recorded on a scale of 4 degrees, in which 3 denoted

[1] *Journal of Physiology*, iii. 3.

a feeling of certainty; 0, no decided inclination for one answer over its opposite; and between the two 1 and 2 naturally found their places.[1] In the following Table, the errors in a set of 10 judgments and the average confidence are recorded for each sense and for each relative difference distinguishing the small lengths from the large ones. Experiments were made on four individuals and include about 1000 judgments.

Sense.	Absolute Length: 100 mm.				Absolute Length: 25 mm.			
	Difference of $\frac{1}{30}$.		Difference of $\frac{1}{100}$.		Difference of $\frac{1}{30}$.		Difference of $\frac{1}{100}$.	
	No. of errors in 10.	Av. confidence.	No. of errors in 10.	Av. confidence.	No. of errors in 10.	Av. confidence.	No. of errors in 10.	Av. confidence.
Eye.....	·75	1·6	2·6	·60	·7	2·1	1·8	1·1
Hand.....	1.3	·58	3·5	·27	1·2	·65	3·3	·2
Arm.....	3·2	·19	...	...	3·8	·17	...	...

The order of differential sensibility of the three senses is Sight, Span, Motion. It is to be noted how regularly the confidence rises as the number of errors decreases. This indicates a distinct feeling of the superior sensibility of Sight over Span,[2] of Span over Motion, as well as a distinction between differences of $\frac{1}{30}$ and of $\frac{1}{100}$. As the errors for lengths of 100 mm. differ little from those for lengths of 25 mm., Weber's law may be applicable to these kinds of sensibility.

Some experiments were made to test the accuracy of the memory for Sight- and Span-impressions. At an early stage of the experiments, when sight was reproduced by span and *vice versâ*, only two lengths were used, one 20 mm., the other 100 mm. long. The blocks were repeatedly reproduced by the eye, and the lines by the thumb and forefinger. Before and after each day's sitting, the subject was required to mark off from memory lines of the two lengths and to guide his thumb and forefinger to the accustomed distances on the Span-triangle. In both cases the memory[3] is extremely accurate and is almost as faultless after

[1] This method was developed in connexion with experiments made by Mr. C. S. Peirce and the writer on "Small Differences of Sensation" (*Memoirs of the National Academy*, vol. iii.), to which the reader is referred for details.

[2] In judging differences with the thumb and forefinger, each hand was tested separately (the mean of the two results being given in the Table), with the result that the left hand made fewer errors. Those experimented upon were right-handed. The right arm alone was tested.

[3] Reproduction by memory is evidently analogous to expressing by inches; the accuracy of these memories favours conclusion (2) on p. 549.

the lapse of a few days as of a few minutes. The Eye-memory is slightly superior to the hand-memory; the arm was not tested. The superiority of sight finds a popular expression in such a phrase as "seeing is believing". The observation of Weber that, in writing letters or imagining them set on the chest, they are naturally inverted, being placed so as to be read by the eye, shows how unconsciously sight rules the other senses. An ingenious experiment of Helmholtz (*Phys. Optik*, p. 601) shows that sight must frequently be corrected by motor judgments. Looking through prismatic spectacles he attempted to guide his finger to an object, and naturally went far off to one side of it. Having learnt to allow for this by practice or by following the finger to the object, he found that the other hand had acquired this facility at the same time, indicating that sight alone was deceived. Children, in whom the co-ordination of sight and touch is imperfect, can guide things to the mouth more readily than to a seen object.

Experiments upon the Blind.

By experimenting upon the blind, in whose education sight—the space-sense *par excellence*—has had no share, one may be able to detect to what extent their space-conceptions have suffered by this loss, and how far the other senses, by increased practice, have been able to supply the deficiency. Experiments were made upon one subject, blind almost from birth, and the results thus obtained verified upon others.

(1) In reproducing the Hand by the Hand or the Arm by the Arm, the error of the blind is slightly greater than that of seeing persons, but in the same direction.

(2) If the Hand reproduces the Arm, the error is somewhat greater, if the Arm reproduces the Hand, much greater, than that of seeing persons, the lines being drawn, on the average, less than half their real length.

(3) In expressing inches[1] by the Hand, the error is slightly larger; by the Arm much larger than that of seeing persons. The Motion-inch of the blind is really about $\frac{1}{2}$ inch long.

This yields the conclusion that the error of the blind in reproducing one sense by the same or by another sense is quite like that of normal persons, excepting that in the latter case the error is somewhat larger, especially when motion is the expressing sense. It follows, too, that the blind person's notion of inches (especially of the motor inch) is much too small. The seeing person corrects this by sight.

When, however, we compare the accuracy with which small differences of length can be recognised by blind and by seeing persons, the effect of practice in the use of the hand and the arm shows a strong superiority in favour of the blind. In the follow-

[1] The knowledge of inches was acquired by feeling the intervals between pegs set upon a wooden ruler.

ing Table the number of errors in 10 judgments and the average confidence are recorded as in the former Table.

		Absolute Length: 100 mm.				Absolute Length: 25 mm.			
		Difference of $\frac{1}{30}$.		Difference of $\frac{1}{100}$.		Difference of $\frac{1}{30}$.		Difference of $\frac{1}{100}$.	
		No. of errors in 10.	Av. confidence.	No. of errors in 10.	Av. confidence.	No. of errors in 10.	Av. confidence.	No. of errors in 10.	Av. confidence.
Span (Hand)	Seeing..	1·3	·58	3·5	·27	1·2	·65	3.3	·20
	Blind...	·5	1·84	2·2	1·56	·9	1·77	2·4	1·57
Motion (Arm)	Seeing..	3·2	·19	...	...	3·8	·16	...	...
	Blind...	1·6	1·39	...	...	2·3	1·37	...	...

As in seeing persons, the sense of Span has a finer sensibility than that of Motion. *In both senses the blind show a marked superiority over the seeing.*[1] By his thumb and forefinger the blind person can appreciate quite as fine distinctions as the seeing person by sight. Moreover, the confidence of the former is unusually high, indicating a reliance on these senses unknown to the latter.

Conclusion.

A reference to the classification of the Space-senses will show how small a portion of the problem has been investigated. Only one in each of the three most disparate methods of gaining linear impressions has been experimented upon. However, the method of experimentation employed is equally applicable to the others (and with some modifications to the study of the Time-sense). Very possibly future research in this direction will greatly supplement and modify the conclusions above reached, although these are based on no less than 28,000 observations, extending over a period of eighteen months.

My thanks are due to the very many persons who in various ways kindly gave up their time to the interests of this rather extended research.

Baltimore, Jan. 1886.

[1] The fact that the discriminative sensibility of the blind is finer but their error in reproducing sensations larger than that of seeing persons, indicates that these two kinds of faculty do not go together. This is borne out by the fact that those individuals who make the greatest error in reproducing sensations are able to judge fine differences as well as or better than others.

V.—DISCUSSION.

MR. W. L. COURTNEY ON BISHOP BUTLER.

By Rev. H. Rashdall.

It is from no desire to disparage Mr. Courtney's *Constructive Ethics* (see Mind 43, p. 435) as a whole that I venture to offer some criticisms upon what I cannot but think his somewhat superficial and unsympathetic treatment of one of the greatest of our English moralists, Bishop Butler. I for one should not dispute the truth of Mr. Courtney's assertion that "the newer studies, and the recent lights of modern times have given . . . . an almost old-world air to Butler's position". In one sense the same might be said of Kant; while in another sense Kant and Butler have formulated in different but not, I believe, fundamentally antagonistic ways the first principles of all ethical systems which supply any real basis for moral obligation. My present purpose is, however, not to estimate Butler's place in the history of ethics, but to show that Mr. Courtney has not understood him.

My first quarrel with Mr. Courtney is that he classifies Butler with the representatives of "Sentimental Altruism". While acknowledging (p. 105) that "it is more for the convenience of classification than for any exact similarity of doctrine that Butler has been classed with such men as Shaftesbury and Hutcheson," he defends this procedure by saying that Butler, though he sometimes called it a power of judging, "yet as often treated Conscience as emotional" (p. 94); and again (p. 106) that Butler's Conscience is "partly intellectual and partly emotional". Now Mr. Courtney makes no distinction between Butler's doctrine in the *Sermons* and his doctrine in the "Dissertation on Virtue," published ten years later. All his quotations come from the former; and if the above assertions are meant to apply to the doctrine of the *Sermons*, I do not believe that it is possible to bring forward a single passage which will support the allegation. Certainly Mr. Courtney does not produce a single syllable in support of them. Nothing but confusion can come from ignoring the very considerable change which Butler's system undergoes in the "Dissertation". For the present, however, I confine myself to the *Sermons*, and I maintain that, so far as they are concerned, Butler is fully entitled to be classed as a Rationalist. When we remember the aberrations into which an exaggeration of the analogy between moral and mathematical truth had led even Clarke and still more Wollaston, it is no wonder that the cautious Butler was on his guard against modes of statement which might seem positively to identify moral and mathematical truth. Still, it is clear enough that his Conscience, though its relation to the other

activities of Reason is not defined, is conceived of as intellectual, or (according to the phraseology of the time) "an intellectual faculty". In the first place Butler's habitual synomym for it is a "principle of Reflection"; sometimes he speaks of it as a "particular kind of Reflection," or simply "Reflection". Once at least he boldly identifies it with Reason, or rather includes it in Reason. "As the idea of a civil constitution implies in it united strength, various subordinations, under one direction, that of the supreme authority . . . . so reason, several appetites, passions and affections, prevailing in different degrees of strength, is not *that* idea or notion of *human* nature, but *that nature* consists in these several principles considered as having a natural respect to each other, in the several passions being naturally subordinate to the one superior principle of reflection or conscience" (*Sermon* iii.). It is clear that in "reason, several appetites, passions and affections" we are presented with an exhaustive classification of the "parts" or "members" of the Butlerian "system or constitution" of human nature. Conscience is clearly distinguished from "appetites, passions and affections"; hence it must be included in "Reason". So again in *Sermon* xii.: "As the form of the body is a composition of various parts, so likewise our inward structure is not simple or uniform, but a composition of various passions, appetites, affections, together with rationality, including in this last both the discernment of what is right and disposition to regulate ourselves by it". It is, however, only to the first of these elements, or "Rationality," that Butler gives the name of Conscience, as he expressly declares in *Sermon* i.: "This principle in man by which he approves or disapproves his heart, temper and action is conscience; for this is the strict sense of the word, though sometimes it is used to take in more". Butler is a writer in whom a very little ingenuity may discover apparent inconsistencies; but I do not believe that it will be possible to quote a sentence from any part of the *Sermons*, or the Preface to them, really inconsistent with this explicit declaration.

It may, however, be urged that the exact words which Butler uses in defining his "Conscience" are of less importance than the general drift and method of his whole system; and with this I should quite agree. And to my mind the main reason why Mr. Courtney has found so much difficulty in forming a clear conception of the mutual relations of the various "principles" of Butler's "human nature" is that he does not perceive that substantially the self-evident authority which Butler claims for "Conscience" is the authority of Reason. Perhaps the best way of bringing out the rational character of Butler's "Conscience"—though to the present writer it reveals itself in nearly every page of the *Sermons*—is to point out the relation between "Self-love" and Conscience as conceived by Butler. It is assumed throughout that the authority of "Self-love" and "Conscience" is in a sense the same in kind. To Mr. Courtney this doctrine is a stumbling-block; but, properly understood, it expresses the fact

that the obligation to promote private good and the obligation to promote public good both spring from a dictate of reason. It is only when the man contemplates himself apart from his relations to his fellows that the reasonable course of action necessarily seems to him to be the gratification of his various "particular passions," "propensions," &c., in exact proportion to the extent to which such gratification will promote his "good on the whole". It is only over the self-regarding passions that "self-love" claims any authority. Butler never, as Mr. Courtney (p. 106) asserts, "elevates Self-love into the rank of a principle of human nature side by side with Benevolence," except in the sense that reflection approves the promotion of a man's own good on the whole when the effect of his actions upon himself only is in question, in preference to all particular passions which could only attain their object by a sacrifice of "good on the whole," just as it approves the promotion of public good, the gratification of benevolence, in opposition to all other desires or passions wherever the public good is in question. What then is to be done in the case of collision between the dictates of benevolence and those of self-love? Butler's answer is put as clearly as it can well be put in the following passage from his Preface, which must be given in full if its force is to be seen :—

"The not taking into consideration this authority, which is implied in the idea of reflex approbation or disapprobation, seems a material deficiency or omission in Lord Shaftesbury's *Inquiry concerning Virtue*. He has shown beyond all contradiction that virtue is naturally the interest or happiness, and vice the misery, of such a creature as man, placed in the circumstances in which we are in this world. But suppose there are particular exceptions, a case which the author was unwilling to put, and yet surely it is to be put ; or suppose a case which he has put and determined, that of a sceptic not convinced of this happy tendency of virtue, or being of a contrary opinion. His determination is that it would be without *remedy*. One may say more explicitly, that, leaving out the authority of reflex approbation or disapprobation, such a one would be under an obligation to act viciously ; since interest, one's own happiness, is a manifest obligation, and there is not supposed to be any other obligation in the case. 'But does it mend the matter, to take in that natural authority of reflection ? There indeed would be an obligation to virtue : but would not the obligation from supposed interest on the side of vice remain ?' If it should, yet to be under two contrary obligations, *i.e.*, under none at all, would not be exactly the same as a formal obligation to be vicious. . . . . But the obligation on the side of interest really does not remain. For the natural authority of the principle of reflection is an obligation the most near and intimate, the most certain and known ; whereas the contrary obligation can at the most appear no more than probable, &c."

There is one passage, and, so far as I am aware, only one, in the *Sermons* which seems at first sight to claim more for Self-love than Butler claimed for it in the Preface, *i.e.*, that it is rational to gratify it when Conscience or Reflection does not supervene, as it does whenever the dictates of Self-love conflict with those of Benevolence ; and that is at the end of *Sermon* xi., where he

appears to admit "that when we sit down in a cool hour, we can neither justify to ourselves this or any other pursuit till we are convinced that it will be for our happiness, or, at least, not contrary to it". I believe that, fairly considered, this passage implies no more than what was admitted in *Sermon* ii., *viz.*, that there is a *primâ facie* obligation to promote one's own good, though it may be overridden by the superior authority of Conscience enforcing the claims of Benevolence. It should be observed that this sentence is ushered in by a "Let it be allowed". Butler is willing to concede this position as to the claims of "Self-love," and yet he is prepared to prove the obligation to virtue even upon that supposition. His own position is that the obligation to virtue is nearer and more obvious than that of self-love; Reason, however, demands that there shall ultimately be an identity between private and public good. But what if there be a collision? Well, in that case Reason would be divided against itself. Reason will still say 'Promote the public good'; yet it will be impossible to show that the conduct of the man who in that case prefers his private good is altogether irrational. Such seems to me to be the meaning of the sentence above quoted when interpreted by the sentence which follows:—"Common reason and humanity will have some influence upon mankind, whatever becomes of speculation; but so far as the interests of virtue depend upon the theory of its being secured from open scorn, so far its very being in the world depends upon its appearing to have no contrariety to private interest and self-love".

How then does Butler make out this harmony between the claims of virtue and those of self-love? By insisting upon the principle that "disinterestedness" is no anomalous peculiarity of "benevolence" or "public passions," but is common to all "desires of objects," the attainment of which gives pleasure because they have been desired, instead of (as Hobbes had maintained) being desired as so many means to the attainment of a maximum pleasure. It is, therefore, Butler maintained, quite as likely *a priori* that self-love may attain its object by the gratification of the benevolent passions as by the gratification of any others. There is no fundamental inconsistency between Benevolence and Self-love: in promoting another's good I am not necessarily subtracting something from my own. To this argument he adds some homely practical reflections on the fallacy of supposing that happiness consists in riches, honours, &c.—things which cannot be given to another without being taken from oneself. And then in the last resort there remains the consideration that Conscience "goes on to anticipate a higher and more effectual sentence, which shall hereafter second and affirm its own". The postulate of immortality reconciles the rare cases of real collision between public and private good.

What is there in all this to justify either the perplexity or the contempt of a critic occupying Mr. Courtney's philosophical standpoint? It is no doubt a pity that Butler should not have

analysed the conception of good and risen to the idea of a higher good of the individual, which is attained by the sacrifice of mere pleasure. He might have written more clearly and more convincingly had he entered upon the question of differences of kind in pleasure, or (what comes to the same thing) differences in intrinsic value between the objects of different desires. But after all his position is fundamentally identical with Kant's. There are two rational ends-in-themselves—Duty and Happiness—the ultimate reconciliation of which demands the postulate of immortality. In the one very important point in which Butler approaches much more nearly to the position of the modern Hegelians than Kant, no justice is done him by Mr. Courtney. Kant held that all motives except the "interest" of Reason in the Moral Law are desires for pleasure. Butler held that a multitude of desires, good, bad and indifferent, were alike in being disinterested: desires for objects are not desires for pleasure. Mr. Courtney writes as if Butler grounded the authority of virtue on its being "disinterested" (p. 113).

> "If benevolence is a merely natural affection, it must rest on the same basis as those natural passions and appetites, which have their own particular ends, like hunger or resentment, and which Butler calls 'propensions'. In that case it cannot be in any sense a supreme principle in man's nature, unless each of such natural 'propensions' be in turn supreme. Therefore, too, if Benevolence be not a principle, Butler cannot insist on the disinterested character of the main principle of action. If, on the other hand, Benevolence is a principle of virtue, it must be reflected on, it must be a sort of reflective desire for good in the world. As merely a simple propension it might be disinterested, but as reflected on it must become interested."

Mr. Courtney is here seeking to prove against Butler the very thing which Butler did his best to establish against the Sentimentalists, with whom he has been preposterously classed by Mr. Courtney. "Disinterestedness is so far from being in itself commendable that the utmost possible depravity which we can in imagination conceive is that of disinterested cruelty" (Preface). He is at the utmost pains to show that, *quâ* "disinterested affection," Benevolence rests, as Mr. Courtney says, "on the same basis as those natural passions and appetites which have their own particular ends". "Every appetite of sense, and every particular affection of the heart, are equally interested or disinterested, because the objects of them all are equally self or somewhat else" (*Sermon* xi.). Butler nowhere, as Mr. Courtney insinuates, makes Benevolence "a supreme principle in man's nature". Conscience or Reflection is "the supreme principle," and it is only because that general good of society, which is the object of Benevolence, is the object whose pursuit that supreme principle approves that Benevolence becomes to Butler—though I do not think that Butler uses the expression—"a principle of virtue". To conclude this part of my criticism, I must strongly demur to the assertion that according to Butler "the balance

between Self-love and Benevolence constitutes virtue" (p. 113). "A balance" seems to suggest the notion of a 'compromise,' or a 'mean,' or a 'judicious mixture,' and of such a doctrine there is no trace in Butler. Butler believed—somewhat too optimistically perhaps—that the preference of benevolence to any passions which conflicted with benevolence was the best way of securing a happy life in the ordinary, popular, unanalysed acceptation of the term. In the rare exceptions he nowhere suggests that a man should steer his course midway between complete selfishness and self-sacrificing benevolence; still less does he (as Mr. Courtney represents) ground the superiority of virtue to vice upon its utility. He consistently maintains that virtue or moral rectitude consists "in affection to and pursuit of what is right and good as such" (*Sermon* xi.), "that virtue is to be pursued as an end, eligible in and for itself" (Preface), though it is with the Cassandra-like air of a man who speaks to a stubborn and perverse generation, and is therefore driven to promise that "there shall be made all possible concessions to the favourite passion," Self-love.

I have now cleared the ground for showing the baselessness of Mr. Courtney's assertion (p. 109), that as the result of an analysis of Butler's system there emerge "five different ways of stating the principles of ethics"—five distinct answers to the ethical problem: (1) "Follow nature"; (2) "Be guided by benevolence"; (3) "Be guided by cool self-love"; (4) "Obey conscience"; (5) "Love God". I maintain that Butler has only one "principle of ethics"—'Obey conscience'. If a man goes on to ask, 'What will conscience prescribe?' Butler will answer, 'Be guided by self-love when your own good only is in question; when other people are concerned, be guided by benevolence,' adding that in so doing a man will as a rule be promoting his own happiness at the same time. Butler never says, 'Be guided by cool self-love' as a general principle of action, though he does say in effect, (1) 'If you insist on being guided by self-love, even then benevolence has a good deal to say for itself'; and (2) 'Since my own good is a *primâ facie* rational end, a rational and self-consistent *theory* of virtue must establish that there is no ultimate irreconcilability between the claims of public and private good'.

I have still to deal with the relation between Conscience and (1) the Following of Nature, (2) the Love of God. I must confess myself unable to understand how any one can have read the Preface and *Sermon* ii. without seeing that the principle "Follow nature" is not put forth as Butler's own answer to the ethical problem. It was a phrase which he found already in current use—first, in that school of ancient philosophy with which he had most in common; secondly, in the "licentious talk" of the fashionable Mandevilles of his time, who maintained—and that by no means as a mere speculation—that the restraints of morality were "contrary to nature". Now Butler expressly assents to Wollaston's remark that "to place virtue in following nature is at best a loose way of talk". He goes on to expose the folly and

self-contradiction of such a principle as a guide to conduct unless it is understood to mean "following the highest part of our nature"—in other words, obedience to Conscience. Where is the inconsistency of presenting his fundamental principle in a form adapted to bring out what was true and expose what was false in the popular philosophy which he found prevalent about him? Suppose a Hegelian writer of the present day were to take up the popular catch-words about "the evolution of morality," "gradual adaptation to environment," "accumulated experience of the race," and the like, and show how all that is true in such principle is recognised—nay, insisted upon with all possible earnestness—in the Hegelian view of a rational conception of moral good gradually unfolding itself in the consciousness of the race and stereotyping itself in the laws and institutions and accepted moral rules of conduct. Would such a writer be justly chargeable with deserting his fundamental principle and giving us two answers to the ethical problem instead of one?

And now as to Butler's theory of the "Love of God". Surely no one who admits with Butler that virtue consists in devotion to the good as such and that God wills what is essentially good, need have any difficulty in recognising the love of God, which Butler explains (*Sermon* xiv.) as a resting "in His will as an end, as being itself most just and right and good"—as constituting the whole of morality and in a sense something more. The following of Conscience, not only in outward act, but with all the heart, with all the soul, with all the strength, is to a theist the love of God. When Butler goes on to speculate that hereafter "an infinite being may himself be, if he pleases, the supply to all the capacities of our nature," when he puts forward this "amor intellectualis" of God not so much as the immediate aim of the present life but as constituting the happiness of the future, he is no doubt on less certain ground. But there is nothing in such an idea,—which (I must repeat) is nowhere put forward as an answer to the "Ethical Problem"—which in the smallest degree justifies Mr. Courtney's assertion that "in *Sermons* xiii. and xiv. we are introduced to a fifth principle of ethics" (p. 110). I have no doubt that, duly tricked out in vague and sonorous Hegelian phrases and purged of too obvious a similarity to the ideas which 'popular philosophy' has been in the habit of regarding as religious, it might be made acceptable even to more esoteric Hegelians than Mr. Courtney.

Throughout Mr. Courtney's treatment of Butler there seems to be a lamentable lack of the genuinely historical spirit. Of course, if no moral system possesses any value which is not explicitly based upon a sound metaphysical system, the ethics of Butler will have no interest for the present-day Hegelian. But if Butler is not worth understanding, why write about him? It is easy enough to criticise the *naïveté* of the position that the question of the rightness or wrongness of any particular action will "be answered agreeably to truth and virtue, by almost any fair man

in almost any circumstance" (*Sermon* iii.)—the want of any idea of evolution or development in his view of conscience—the want of discrimination between the subjective and the objective rightness of actions. On these subjects Mr. Courtney has said less than he might have said. These and many more positive mistakes of Butler—which are of course to a great extent characteristic of the age rather than of the man—would have afforded ample scope for the exercise of Mr. Courtney's powers of criticism. His insistence on the deficiencies of an ethical system which rests either on no metaphysic at all or upon the metaphysic of Locke is of course justifiable enough. But the limitations of Butler's thought should not have blinded Mr. Courtney either to the extreme and permanent value of Butler's exposure of the essential *hysteron-proteron* of Hedonism or to the essentially rational character of his ethical system. When writers of Mr. Courtney's school are dealing with Kant, they make very light of the shocks to common-sense, the utter impossibility of extracting from his system a workable criterion, the difficulty of reconciling one part of the system with another, the barbarous and sometimes almost meaningless paraphernalia of technicalities through which one has to penetrate to the really fundamental ideas of the writer. It is one of the best features of Mr. Courtney's interesting book that he freely admits such deficiencies and protests against the "air of mystery" in which metaphysicians delight to envelop their system. He makes it his object to bring out the really essential, the permanent, the intrinsically valuable element in the writings of such masters as Kant and Hegel. I do not in the least complain of such a procedure; but why should it not be extended to poor Butler? The reason is to be sought in the fact that even Mr. Courtney cannot wholly emancipate himself from the prejudices of his school, which prevent its members from recognising an essential similarity of doctrine when disguised by a more popular and less technical phraseology, and when divorced from the "metaphysic" with which they have been accustomed to associate it. Surely it is possible to give some reasonable answer to the questions, 'What is the ethical standard?' 'Why must I be moral?' 'What is the Moral Faculty?'; without at the same time answering the questions, 'What is Knowledge?' 'What is Being?' A man may surely have sound and even philosophical ideas about the nature of Morality without being prepared to commit himself to the identity of Knowing and Being; though I grant that his ideas about morality are likely to be deeper and more solidly-founded if he has made up his mind upon the latter questions also. If Butler, with all his deficiencies and limitations, has contributed to make possible alike the answers to the ethical problem of Ethics which is given in the *Methods of Ethics* and the answer which we find in the *Prolegomena to Ethics*, he ought not to have been slightingly treated because he has contributed little or nothing to Metaphysic properly so called.

THE DEFINITION OF NATURAL LAW.

By Norman Pearson.

Under existing circumstances an attempt to criticise the accepted definition of Natural Law is a somewhat venturesome undertaking. There is perhaps no single term which is at once so rigidly defined by the learned and so consistently misconceived by the ignorant. It has often been pointed out, and with perfect justice, that for a great deal of this confusion scientific men have nobody but themselves to blame. The term "Law" was most unfortunately selected by science to denote something which has hardly a feature in common with law in its ordinary meaning. In consequence of this latent ambiguity the scientific conception of Natural Law has had, and probably for a long time will have, to struggle with a mass of popular misconceptions, in addition to certain more legitimate criticisms. It is extremely hard to persuade people new to the subject that "Natural Law" in the scientific sense involves no notion of an over-ruling ordinance; and it is perfectly easy to appreciate the difficulty which such people feel. It is obviously unnecessary, however, to discuss this distinction for the benefit of my present readers, and I only propose here to suggest a special modification of the definition of Natural Law which I think in honesty the facts of the case require.

The definitions of Natural Law given by scientific writers are all substantially identical, and I only quote from two of the best-known in order to illustrate the point which I wish to enforce. Lewes (*Problems of Life and Mind*, p. 308) describes a law of nature (in the sense now under discussion) as "a notation of the process *observed* in phenomena". Again, "a law is simply the notation of *observed* facts". So too Mill (*Three Essays on Religion*, p. 14) says that laws of nature "are neither more nor less than *observed* uniformities in the occurrence of phenomena". (The italics in the above quotations are mine.) Other writers speak of them as generalisations from experience; and, in short, the notion of *previous observation* or *ascertainment* enters invariably into the scientific definition of Natural Law. But it is in this respect that I think all such definitions are faultily severe.

It is obvious, of course, that Ascertainment is a necessary pre-requisite to the classification of natural laws. We cannot pronounce upon the uniformity of a natural process until such uniformity has been observed: in other words, we cannot know a natural law till we *do* know it. But though this proposition is indisputably true, it is nevertheless indisputably barren; and it is surely needless to encumber a scientific definition with the paste-board armour of an empty truism.

So far, however, the mischief is not very serious; and, if this superfluous verbiage adds but little to the strength of the scientific position, it does not, *primâ facie*, weaken it against external attack. Indeed it may be admitted that it has had its uses in the past. *A priori* theories of the universe and its operations were enemies far more dangerous to the dawning conception of Natural Law than they are now; and it was at one time a positive necessity for science to exclude resolutely from its realm the whole host of unverified and unverifiable assumptions conjured up by the disorderly imaginings of theology. But at the present time this danger has practically disappeared. Erroneous views of the meaning of Natural Law no doubt exist, and in abundance; but they are not often to be found now in high places; and, as a general rule, the educated theological view of Natural Law is quite in accordance with the view of science. At the same time there is a good deal of antagonism on the subject between theology and science, which, perhaps, is partly due to this notion of Ascertainment on which scientific disputants insist as essential to Natural Law. And upon this point I venture to think that scientific disputants are wrong.

Admitting, as of course we must, that before we can describe any process of phenomena as uniform we must first succeed in observing its uniformity, I nevertheless think that the insertion of the ascertainment-clause into the definition of Natural Law is really illegitimate; and it is illegitimate because, at the very least, it obscures the point which science is concerned to enforce. It is perfectly accurate to describe all known natural laws as observed uniformities of process: but surely the essence of a law is its *uniformity*, and not the accidental fact that it has been *observed*. Science is perpetually adding to the number of discovered laws; but these laws existed from the time when the operations of nature began, and the mere fact of their discovery does not add a tittle to their validity. In short, ascertainment is necessary to our *knowledge* of natural laws, but it is not the least necessary to their *existence*.

Nor is this distinction a mere fastidious nicety of criticism. The ascertainment-clause may be, and often is, a positive obstacle to an increase of knowledge, because we are incurably apt to infer, in the case of the more familiar natural laws, that we are acquainted with *all* the possible antecedents of their operation. To every Englishman it is a familiar experience that, under requisite conditions, water will lose its fluidity and become ice. But to the Saracen in *The Talisman* such a phenomenon appeared an impossible portent, and he very logically hesitated to believe in it. It is perfectly true that this objection does not strictly affect the current definition of Natural Law, which only asserts that from certain antecedents, *neither more nor less*, certain consequents, *neither more nor less*, will follow; but, as I have said, this is apt to be forgotten, and a long and unbroken experience

tends to make us regard a natural law, not as a uniformity of process *under certain circumstances*, but as a uniformity of process *under all circumstances*.

The result of this misconception is obvious. The moment we lose sight of the limited and relative character of all human observation, and begin to regard natural laws as invariable, not only under previously ascertained conditions, but under all conditions whatever, we transcend the limits of legitimate inference, and practically shut up progress in a *cul-de-sac*.

I do not waver a hair's breadth from my faith in the absolute jurisdiction of Natural Law in its widest sense; I only demur to the fallacious assumption that "natural law" must be treated as equivalent to "ascertained natural law" only; in other words, to the assumption that the possibilities of things can be logically limited to the ascertained possibilities of experience. Experience is a sure guide so far as it goes, but nobody will pretend that the experience of the world to-day has exhausted all the possibilities of the experience of the future.

With regard to what I may call purely physical laws of nature, the ascertainment-clause is less likely to lead to serious error. But why? Simply because the conditions under which the commoner physical laws operate are, for practical purposes, already ascertained. We can pronounce with absolute confidence upon the phenomena of gravitation as shown by material bodies, because, from their comparative simplicity and the frequency of their occurrence, we are intimately acquainted with their necessary conditions. But the moment we turn from these to the phenomena of life and mind, we must needs leave our certainty behind us. Nor is this in any way a matter for surprise. Both the science of life and the science of mind are yet in their infancy; and, even apart from this, their phenomena display an intricate complexity in place of the comparative simplicity of the phenomena of physical laws. This difference appears on the very threshold, as the distinction between organic and inorganic chemistry sufficiently shows. We are doubtless entitled to attach as much weight to ascertained uniformities in the biological or the psychological branch of science as we allow to the ascertained uniformities of physical law. But in these comparatively unexplored spheres of inquiry we are not entitled to deny that an occurrence is possible, because it has not fallen within previous observation. Let me not be misunderstood. I do not impeach in the slightest degree the validity of ascertained biological or psychological laws. Such laws must be loyally admitted so far as they go. I only contend that they do not necessarily go far enough. They may be true accounts of certain biological or psychological facts, but they do not exclude the possibility of other and apparently conflicting biological or psychological facts.

Let me take a prominent instance in biology to illustrate this. The doctrine of 'Biogenesis' is probably accepted by ninety per

So far, however, the mischief is not very serious; and, if this superfluous verbiage adds but little to the strength of the scientific position, it does not, *primâ facie*, weaken it against external attack. Indeed it may be admitted that it has had its uses in the past. *A priori* theories of the universe and its operations were enemies far more dangerous to the dawning conception of Natural Law than they are now; and it was at one time a positive necessity for science to exclude resolutely from its realm the whole host of unverified and unverifiable assumptions conjured up by the disorderly imaginings of theology. But at the present time this danger has practically disappeared. Erroneous views of the meaning of Natural Law no doubt exist, and in abundance; but they are not often to be found now in high places; and, as a general rule, the educated theological view of Natural Law is quite in accordance with the view of science. At the same time there is a good deal of antagonism on the subject between theology and science, which, perhaps, is partly due to this notion of Ascertainment on which scientific disputants insist as essential to Natural Law. And upon this point I venture to think that scientific disputants are wrong.

Admitting, as of course we must, that before we can describe any process of phenomena as uniform we must first succeed in observing its uniformity, I nevertheless think that the insertion of the ascertainment-clause into the definition of Natural Law is really illegitimate; and it is illegitimate because, at the very least, it obscures the point which science is concerned to enforce. It is perfectly accurate to describe all known natural laws as observed uniformities of process: but surely the essence of a law is its *uniformity*, and not the accidental fact that it has been *observed*. Science is perpetually adding to the number of discovered laws; but these laws existed from the time when the operations of nature began, and the mere fact of their discovery does not add a tittle to their validity. In short, ascertainment is necessary to our *knowledge* of natural laws, but it is not the least necessary to their *existence*.

Nor is this distinction a mere fastidious nicety of criticism. The ascertainment-clause may be, and often is, a positive obstacle to an increase of knowledge, because we are incurably apt to infer, in the case of the more familiar natural laws, that we are acquainted with *all* the possible antecedents of their operation. To every Englishman it is a familiar experience that, under requisite conditions, water will lose its fluidity and become ice. But to the Saracen in *The Talisman* such a phenomenon appeared an impossible portent, and he very logically hesitated to believe in it. It is perfectly true that this objection does not strictly affect the current definition of Natural Law, which only asserts that from certain antecedents, *neither more nor less*, certain consequents, *neither more nor less*, will follow; but, as I have said, this is apt to be forgotten, and a long and unbroken experience

tends to make us regard a natural law, not as a uniformity of process *under certain circumstances*, but as a uniformity of process *under all circumstances*.

The result of this misconception is obvious. The moment we lose sight of the limited and relative character of all human observation, and begin to regard natural laws as invariable, not only under previously ascertained conditions, but under all conditions whatever, we transcend the limits of legitimate inference, and practically shut up progress in a *cul-de-sac*.

I do not waver a hair's breadth from my faith in the absolute jurisdiction of Natural Law in its widest sense; I only demur to the fallacious assumption that "natural law" must be treated as equivalent to "ascertained natural law" only; in other words, to the assumption that the possibilities of things can be logically limited to the ascertained possibilities of experience. Experience is a sure guide so far as it goes, but nobody will pretend that the experience of the world to-day has exhausted all the possibilities of the experience of the future.

With regard to what I may call purely physical laws of nature, the ascertainment-clause is less likely to lead to serious error. But why? Simply because the conditions under which the commoner physical laws operate are, for practical purposes, already ascertained. We can pronounce with absolute confidence upon the phenomena of gravitation as shown by material bodies, because, from their comparative simplicity and the frequency of their occurrence, we are intimately acquainted with their necessary conditions. But the moment we turn from these to the phenomena of life and mind, we must needs leave our certainty behind us. Nor is this in any way a matter for surprise. Both the science of life and the science of mind are yet in their infancy; and, even apart from this, their phenomena display an intricate complexity in place of the comparative simplicity of the phenomena of physical laws. This difference appears on the very threshold, as the distinction between organic and inorganic chemistry sufficiently shows. We are doubtless entitled to attach as much weight to ascertained uniformities in the biological or the psychological branch of science as we allow to the ascertained uniformities of physical law. But in these comparatively unexplored spheres of inquiry we are not entitled to deny that an occurrence is possible, because it has not fallen within previous observation. Let me not be misunderstood. I do not impeach in the slightest degree the validity of ascertained biological or psychological laws. Such laws must be loyally admitted so far as they go. I only contend that they do not necessarily go far enough. They may be true accounts of certain biological or psychological facts, but they do not exclude the possibility of other and apparently conflicting biological or psychological facts.

Let me take a prominent instance in biology to illustrate this. The doctrine of 'Biogenesis' is probably accepted by ninety per

cent. at least of scientific authorities. Let us assume, *argumenti gratiâ* at all events, that the testimony of experience shows that life invariably springs only from some antecedent life. Can we therefore say that Biogenesis is a law of nature? In a sense we can; and—my postulate being granted—we are perfectly justified in so saying. But we must not lose sight of the fact that the justification for this assertion rests on experience only; and therefore, that we cannot legitimately extend the scope of the law beyond the realm which experience illumines for us. We may be entitled to say: All life springs from antecedent life *now*. We are not entitled to say: All life *has* sprung from antecedent life; for it is obvious, on any theory of the universe, that at some period or other life must have sprung either from non-life or from nothing. Under these circumstances therefore, whatever they may have been, not Biogenesis but 'Archebiosis' was the biological law of nature that then obtained.

The facts seem so simple when put before us *in extenso* that error appears impossible; and so long as we keep to the facts, error is impossible. But we have a persistent tendency to stretch the mantle of experience over conditions of existence which lie necessarily outside it; and in this way we come to pervert a natural law, which is merely an enunciation of what *is* under given conditions, into a prophetic enunciation of what *must be* under conditions of which experience can tell us little or nothing.

Take again the famous saying that "Miracles do not happen". In a sense this is indisputable from a scientific point of view. We may even go further, and say that a miracle, in the sense of a violation of the order of nature, never could happen. But then comes the question, What is the order of nature? The order of nature is constant in the sense that causation pervades its minutest detail. Nature's accounts, so to speak, are most strictly kept. No force appears on one side of a natural equation which is not fully accounted for on the other, even though it be not always within our power to analyse the force-distribution which takes place. But the order of nature, as we perceive it, is not constant in the sense of being identical—identical, that is, from the beginning till now, and from now into the future of eternity.

Just so far as science insists on applying the ascertainment-clause universally to the interpretation of nature, so far will theology be able to insist triumphantly on the occurrence of miracle. If from our present observation that life springs invariably from antecedent life, we proceed to declare that this *observed uniformity* is an absolute natural law, it is open to any critic to retort that in this case natural law must at some time or other have been violated, since at some time or other the original life must have arisen from some other than an antecedent living source. The error lies in restricting "Natural Law" to "an *observed* uniformity"; which amounts, in fact, to an attempt to impose the transient conditions of the present upon an unknown

past and an unknowable future. Such an attempt is really foredoomed to failure, and gives ample opportunities for the enemy to blaspheme. But once get rid of the qualification "*observed*" from the definition of Natural Law, and Science is placed at once in a sounder and more tenable position.

Moreover the ascertainment-clause is open to another objection. It is clear that our possibilities of observation are restricted not only by the limits which time imposes, but by the imperfection of our faculties. The moment we get beyond the commonest phenomena of every-day life, we can rarely be quite sure that a sufficient number of instances have been observed to justify a universal induction. But over and above this we have to take into account our possibilities of error in the process of observation. Such errors cannot be entirely excluded even from the laboratory, and, in cases in which experimental tests are impossible and we are confronted with the phenomena which uncontrolled nature presents to us, it is obvious that the possibilities of error are immensely increased. This is particularly true in the relations of body and mind. The antecedents ABC may be followed a million times within our experience by DEF as consequents. But on some occasion X is added, unknown to us, to the antecedents, and we are startled by the appearance of an unfamiliar Z in the consequents. There are two solutions in which our perplexity usually takes refuge, the one being that Z is a subjective illusion, the other that it is a mystery which smacks of the miraculous. Both, of course, are equally untrue, and both alike spring from a form of intellectual bondage. The man who is slave to a limited conception of Natural Law dismisses the difficulty by declaring the new appearance an illusion. The man who is slave to superstition, religious or otherwise, calls it a mystery, a supernatural something, whose coming and going is wholly independent of the orderly course of nature, and consequently an indirect proof of the particular form of superstition which he happens to revere. And yet all the time it is a perfectly orderly phenomenon, the product (if I may so call it at the expense of strict accuracy) of Natural though *unobserved* Law.

The correlations of body and mind are still most imperfectly understood, and till comparatively lately their existence was hardly known. Before it was understood that body and mind cohere, not as independent elements of a temporary combination, but as mutually dependent members of an organic whole, a large class of rare bodily phenomena were not unnaturally regarded by many as miraculous or supernatural. Stigmatisation, healing by faith, many of the phenomena of trance, mesmerism, clairvoyance, &c., formerly admitted of no other explanation. But now that we know the power of imagination and its related faculties to produce physical pain or even injury; when we find that gout may be cured by a sudden fit of emotion, warts charmed away by counting or being treated with coloured water, and a variety of

therapeutic results produced solely by means of subjective expectancy; when stigmatisation has taken place under a close medical supervision;[1] when hypnotism has become a scientific study, and in skilful hands can be employed with extraordinary precision; when even the exceptional facts of clairvoyance seem to admit of explanation as the "transference of special sense":[2] with these and many similar discoveries to lighten our darkness, we now find little difficulty in bringing the mysteries of the past within the natural law of the present.

But satisfactory though it be that our *knowledge* of natural order should be enlarged by the recognition of these phenomena as orderly, it is obvious that, quite independently of our knowledge or ignorance of the fact, these same phenomena, though alternately blessed as miraculous or banned as superstitious, were never anything but orderly.

These experiences of our errors in the past ought to be useful for our guidance in the future. A vicious extension of the principle of the ascertainment-clause has led scientific thought to reject as impossible facts which a further inquiry has established, and the same tendency still prevails widely.

The phenomena to which I have alluded above are signal instances of what natural order may unexpectedly comprise; and, with the sciences of psychology and physiology hardly half grown, there is every reason to believe that the list will be largely increased. With these considerations before us, it is surely unwise to pass sentence prematurely on phenomena which are strange to our experience, or to depreciate the research which strives to bring them to the light of day.

Again, as I have already intimated, the current definition of Natural Law seems to bear too hardly upon theology. The rigorous claims of previous ascertainment brand all the miracles of theology with the stigma of falseness. It is clear, I think, that this is unjustifiable. It is often possible enough that the reputed miracle may have taken place in the sense that, as an event, the record of its occurrence may be true. All that science need dispute is its miraculous character, and this of course is quite incompatible with any sound conception of Natural Law. Theology, it is true, sometimes seeks to evade this conclusion by recourse to the notion of a "higher" law, which is intended

[1] For these facts I refer generally to Dr. Carpenter's *Mental Physiology*, chap. 19 ("The Influence of Mental States on Organic Functions"). One striking instance which he mentions I briefly reproduce:—A lady while watching a child playing by a window saw the sash suddenly descend upon its hand. The violent emotion which this sight aroused in her produced a corresponding injury in her own hand so severe as to necessitate an operation. I may add, perhaps, that I have known a similar though less pronounced case happen to a friend of my own.

[2] A paper read before the Royal Society a few years back by Dr. Davey.

to preserve both the uniformity of nature and the miraculous character of the so-called miracle. The phrase, however, is extremely misleading, and in this connexion is almost meaningless. If an invariable order of nature exists at all, there can be no degrees of validity between its processes. All alike are invariably orderly, the simplest being just as stubborn in its regularity as the most abstruse. The theory of a "higher" law only derives what plausibility it possesses from an importation into the meaning of "Natural *law*" of the illegitimate sense of "*ordinance*". It is possible to imagine degrees of validity or authority between different ordinances or spells; it is quite impossible to imagine any such degrees between the various manifestations of Natural order. Moreover, even if the doctrine of a higher law were admissible, it would not save the miracle, *qua* miracle. For, inasmuch as the miracle is still *ex hypothesi* referred to Natural Law, *i.e.*, is regarded as a link in some natural chain of causation, it is still a natural and not a miraculous phenomenon, and consequently its evidential value as a *miracle* is absolutely *nil*.

But this doctrine of "higher laws," erroneous though it be, does throw some useful light on that class of phenomena to which I have already referred, and which are apt to be excluded from acceptance by the strict definition of Natural Law. We cannot properly admit any variance of validity between laws of nature, any more than we can admit that such laws are occasionally irregular. But, on the other hand, we can hardly help admitting the possibility at any rate of orderly phenomena as yet unknown to us. Phenomena of this kind may have escaped observation, either by reason of the limitation of our own faculties, or because their antecedents are complex and therefore comparatively rare, or from a combination of both these reasons. Consequently the strangeness of a phenomenon does not justify us in pronouncing it either a delusion or a miracle, for its unusual character may well be referred to a combination of unusual but perfectly orderly conditions.

If this be so, the case against the ascertainment-clause is made out. If we believe Natural Law to prevail *universally*, it is incorrect to define it as an order which is *limited*—limited, that is, by the condition of previous observation. If, on the other hand, we desire to restrict its meaning to *observed* uniformities of process, it is inaccurate to call it *Natural* Law; seeing that, *ex hypothesi*, it does not extend to the *whole* of nature, but only to that small part of it which has fallen under human observation.

VI.—CRITICAL NOTICES.

Outlines of the History of Ethics for English Readers. By Henry Sidgwick, Knightbridge Professor of Moral Philosophy in the University of Cambridge. London: Macmillan & Co., 1886. Pp. xxiv., 276.

The publication in a handy shape of the article "Ethics" from the *Encyclopædia Britannica* is a boon to the student; but the present manual is far from being a mere reprint. A judicious revision (with occasional rearrangement) has resulted in an extension of the essay to nearly twice its original length, but with little alteration of the original proportions. Of these additions there may be specified under the head of ancient ethics an excellent *résumé* of the *Nicomachean Ethics*, an account of the Roman moralists, with more detailed notices of Plato and Epicurus; while in the modern period, besides a fuller analysis of Butler, we get a few (perhaps too few) words on the topics of free-will, evolution and pessimism. The new matter now incorporated will not fail to make the handbook more serviceable to those for whom the requirements of modern life include an acquaintance with the rudiments of moral science. But alike for the academic and the general reader Professor Sidgwick's *Outlines of the History of Ethics* will commend itself as the work of a master in the subject, who in a few pregnant pages has sketched out skilfully and judicially the history of Greek, of mediæval, and of English reflections on the aims and laws of human conduct.

The unity of the work is expressed in the qualification of its contents as meant for "English readers". It is addressed to a public which may be assumed to wish a knowledge of the larger outlines of speculation on the ideas of right and wrong, good and evil, but which at the same time will probably take faint interest in those moralists whose theories do not form an integral part or an indispensable pre-requisite of the current stock of ethical ideas. Mr. Sidgwick confines himself accordingly to the old story—yet as important as old—which traces the origin of our modern civilisation. As it specially chronicles the ethical development this record begins with the Greek thinkers, proceeds through the transformation-period in which their conceptions were modified by theological dogma, and concludes in Mr. Sidgwick's pages by tracing with critical observation the course of English moralising from Hobbes to the present day, when the ideals of ordinary no less than of speculative thought seem to be threatened with absorption in the swelling flood of realistic science. Outside that historical march of theory there are isolated movements of ethical reflection, running in narrow grooves of religious creeds

and ecclesiastical law; and there is everywhere a vast congeries of social observances out of which there has hitherto failed to emerge any formulation of principle. Of the latter, or raw material of morality, a history of ethics in the common acceptation does not treat. But of the other or theological ethics it is for English readers necessary to give so much account as is due to its eminent co-operation towards forming the views on the ultimate aim and law of conduct held even by those who claim to be emancipated from the special traditions of Christianity. Mr. Sidgwick's work is a record of the attempts made by Greek and Roman philosophers, by the Fathers and Schoolmen of the Catholic Church, and by a succession of English essayists, to formulate the law of human life, to indicate the grounds on which it was based and the methods by which it could be ascertained. This limitation of the sketch is from what are called practical considerations entirely justifiable. Yet, even without entering on a minute examination of outlying fields, it would have been well to indicate (in such terms as may become the non-specialist in oriental learning) the wider scope of a history of ethics which should include (*inter alia*) the products of moral reflection in China and in ancient India.

A history presupposes a certain unity of subject-matter. Accordingly Mr. Sidgwick begins by briefly stating the scope of the ethical problem in somewhat the following terms. The subject of ethics is the study of man's well-being (variously conceived as virtue or pleasure), with some explanation of the nature of the moral law or of duty, and of those psychological conditions in the individual, which contribute to mould or modify his sense of obligation or conscience. So far as the being or well-being of each depends on that of his community, this complication of requirements makes the province of ethics overlap that of social and political science. So far as the laws of the universe affect man, morals depends upon metaphysics or on general physics; and so far as the law of conduct is referred to a divine legislator, ethics is co-terminous with theology. But if, as in English moralists, these problems are left on one side, moral psychology comes to usurp the whole ethical province as its own.

The only fault which we have to find with this description is that it is little else than an abstract *résumé* of the facts presented elsewhere in the book under their historical aspect. And perhaps Mr. Sidgwick would urge that to state the differences in conception of the ethical problem as understood at different ages is enough for the historian. He neither adopts the standpoint of the bold theorist who, possessed of a firm conception of the "science of ethics," assigns to past and present thinkers their place in his model scheme, nor on the other hand does he make the sceptical suggestion that ethics is nothing but a rhapsody of prolegomena and metaphysics, and that the diversity of its methods is a consequence of its radical incoherency of plan. Yet even the critical historian may usefully supply a more searching

clew to the labyrinth of ethics, and probe more deeply the causes of the decay or efflorescence of ethical speculation.

What Mr. Sidgwick has put most prominently forward in his account is the contrast between the chief aim in Greek and in modern ethics. In Greek times ethics,—free from any idea of an already accomplished salvation only needing to be received, and an already promulgated law only needing to be apprehended and obeyed,—launched boldly forth on the quest for the Chief Good—the voyage to discover the means whereby human life may be lived to the best effect. Gradually it forced itself upon the notice of thinkers that, in order to distinguish the good from the apparent good (the merely useful and pleasant), a criterion must be taken in what was at first known as reason and right reason, but was afterwards more objectively entitled nature and the law of nature, and even the moral law and duty. Yet the Greek, though he owned that the Good must be determined by law and reason, was reluctant to adopt an ethical formalism, and even in affirming knowledge to be the chief good explained that it was the knowledge of the good. The soul according to the Platonic description rises by the fresh direction of its intellectual eye to an apprehension of ever higher and higher forms of good: and it is always good towards which that eye is inherently turned. The advance in the development of this doctrine was seriously harassed by the prevalence of a common antithesis between law and nature. To the citizens of a country broken up into petty communities the side of law which most impressed itself upon reflection was its arbitrary and particularist character, as of something running counter to that free, original and spontaneous bent of things called nature. Yet alongside of this emphasis on the features of authoritative and external dictation, philosophers of more than local patriotism set forth the ideal of a law which is passionless and self-regulating mind, the voice of right reason, and which to those later Stoics who saw the great vision of the Roman Empire became the code of organisation for the universal city of God. In the hands of the Christian scholars of the early centuries this ideal became the law of God. Yet one of the most interesting passages in Mr. Sidgwick's book is where he shows the new virtues and the new forms of old virtues that Christianity made influential in the world. And the sum of his pages on this point is to the effect that not in the idea of morality as divinely ordered, but in the freshening of those impulses which gave birth to faith, hope and love, and in the vivifying by a personal example of the sense of divine ownership of man, lay the specially progressive influences ethics owed to Christianity. In the brotherhood of love, in the fact-transcending power of faith, and in the hope of endless improvement, lay the new dynamic, which supplied what had been lacking in the old conception of reason and knowledge: reason and knowledge which had never been what they claimed

to be, but only visions of a passing perfection, 'moving about in worlds not realised'.

But the great lesson alike of Greek and of early Christian ethics remained to be drawn by more modern philosophy. The law of nature or of God considered as the supreme canon of morality is to be carefully distinguished from law as understood by jurisprudence or by natural science. The great delusion which led to casuistry and favoured hypocrisy was the supposition that the law of God and nature was a completed code needing only to be applied by continuous deduction, or a set of facts requiring to be detected by persistent observation. That law is of infinite paragraphs, but one principle, and that principle itself is not a general order, but a test of all action,—not a command to do this or that but a condition which all conduct must conform to on pain of failing to be moral. The moral law—such is the special contribution of modern philosophy—alike in Hobbes, Locke and Kant—can only be stated in a formal shape: any concrete or material rules fall short of the universality that an ethical law requires. The law of ethics is but one, and in its baldest form bids us have regard to the universal in all we do. To lay down this as the prime fact of morality and to analyse its presuppositions was the achievement of Kant. And he is thus the founder for modern times of idealistic as opposed to realistic ethics. He affirms most clearly that the characteristic of moral action is that it proceeds from a being implicitly the member of a community—a community unlimited in time and space—including (in the language of ancient thinkers) all rational beings. Of this supreme principle altruism is an application: and Kant lays the foundation (or analyses the intuitional datum) on which Bentham and Comte equally build. Some modern writers have been led to say in consequence that all ethics is intrinsically social ethics. Yet even if we allow the designation, we must add that for ethical theory the society in question must be conceived as universal and ideal in the first instance, and only secondarily as real and finite. It is the failure to recognise this distinction between absolute ethics and the relative ethics which shades into jurisprudence that constitutes the chief defect of the common versions of utilitarianism. It is the merit of Plato, Hobbes, Kant and Mr. Spencer to have given it a clear expression.

The account of Greek ethics is like the rest of the book sure to teach much even to those who are familiar with the ground it traverses. Beginning with the first efforts to isolate ethical conceptions, Mr. Sidgwick says a little about Pythagoras, Heraclitus and Democritus. As to Pythagoreanism, there is probably insufficient prominence given to its mathematical formalism (*e.g.*, "harmonious equality" is scarcely an adequate rendering); and we miss any note of that insistence on purity or asceticism to which many pre-Socratic thinkers bear witness. The picture given of the labours of the Sophists and Socrates,

though of great merit, errs by attaching too much weight to the character of the Sophists as teachers of virtue (a pretension which only some of them made), instead of treating them as the heralds of that general culture, which Athens called for in consequence of the political results of the Persian invasion. It is not likely that Greeks ever became "persuaded that good conduct was something which could be learned from lectures," but they might reasonably suppose that lectures could give some 'tips' on the ways to success in public life and on the new ideas of polite letters which the stress of circumstances had withdrawn from the circumference to the centre of Hellas. All through this part of the book some confusion arises by treating Ἀρετή as another name for good conduct: and this is especially to be regretted as Mr. Sidgwick well points out that the knowledge of the good is not at all the same thing as knowledge of our duty. [The words on p. 24, "those who knew *how to do* just," &c., is a mistranslation which obscures the point in question.] What Socrates was anxious to enforce was that Ἀρετή was not, according to the old conservative doctrine (*e.g.*, of Pindar), a hereditary gift, but a capacity depending upon instruction,—not indeed on purely verbal instruction (as Mr. Sidgwick, falling into what Dr. Bain calls the fallacy of suppressed correlative, seems to think). And it is going too far when on p. 26 an attempt is made by an interpretation of a dubious authority like the 7th book of *Eth. Nic.* to represent Socrates as neglectful of the need of firmness of purpose. What Socrates taught was, as is well said, in p. 31, the "duty of living by consistent theory". What seems to characterise him is the immense fund of realism, which appears in a dislike to abstract generalities and sentimentalism, and makes him bring the Beautiful and Right to the touchstone of the Good, and insist on the relativity of the latter in each particular case. So that when (pp. 29, 30) it is said that he sought for "man's ultimate and abstract good," it may be questioned whether this is not introducing a conception first broached by Euclides and worked out by Plato.

The account of Plato labours (as indeed the limits of a manual almost necessitate) under the effects of the attempt to co-ordinate the several dialogues and thus import into him a greater symmetry of system than is possible for a writer, who (and in saying so, I differ from Mr. Sidgwick) never allows philosophy to pass definitively into the lecture-room. It is an unfortunate and misleading version of the very or real good to call it "good in the abstract": and the same may be said of the phrase "abstract thought" on p. 39. It is doubtfully right to call the "utilitarianism" of the *Protagoras* a transition-stage of Plato's thought, only temporarily held. The conclusion of the dialogue that virtue, both general and special, lies in knowledge, is repeated in the *Phædo*, guarded however by the addition that it is not an exchange of pleasure for pleasure, but the presence of knowledge which makes the 'right

coin' of virtue. Plato is always concerned (not merely in the *Laws*) to show that virtue is happiness; but his contention is that the identity is only complete where virtue attains its full actuality in the wise man. One may find some opportunity for reflection in determining how far Plato ever fully identified virtue with wisdom, or how far he ever ceased to do so. Nor can pleasure be said to be ever so absolutely distinguished from good by Plato, so treated as co-ordinate with it, as Mr. Sidgwick suggests,—at least if we make due allowance for the ambiguity of the word pleasure. And in the account of the cardinal virtues, there is hardly enough notice taken of the fundamental hypothesis of an order on which justice is based, the doctrine of a natural directing authority in reason, with a normal sphere of activity for each function. Lastly, it can scarcely be true (p. 51) that Plato held the knowledge of all particular goods to be implicitly contained in the supreme science of good, if that means (as explained on p. 54) that we can deduce the particulars of human well-being from a knowledge of absolute good.

Mr. Sidgwick does excellently in pointing out the substantial agreement of ethical view between Aristotle and Plato; and he is no less well aware that the Aristotelian ethics is full of superficialities and absurdities, and owes its importance in modern times mainly to the part it has played in giving the framework to later moralists. But he seems unduly to praise Aristotle for the inductive character of his method,—a point which falls in with his disposition to find the analogue of modern induction in the Aristotelian ἐπαγωγή. It is doubtful *induction* to suppose a unity in the chief end of conduct: and when it is inferred that because a piper has a function, therefore man as man has one too, the conclusion only follows on the assumption that man is a member of an ordered system (Q. E. D.). Moreover the whole reasoning is only a paraphrase of Plato. Noting in passing that the rendering of ἕξις by "tendency" seems as defective as that of τέχνη by "technical skill" is commendable, we proceed to notice the remarks that Aristotle does not distinguish in describing liberality between selfish and benevolent expenditure, but that he does recognise benevolence in his theory of friendship. It may be doubted whether "disinterested benevolence" is found even there: whether "altruism" has any place in the Greek theory of virtue. The distinction of the true friendship for good men from that of other kinds is not that the former is disinterested, but that it is founded on a permanent characteristic of the person, not an accidental or external relation. The aspect of virtue on which the Greeks laid stress was its self-regarding character: but the best of their sages always taught that the true self was least affected with the defects of individuality.

Passing on from the ineffectual fluctuations of Aristotle between ideal morality and the laxity of ordinary judgment, Mr. Sidgwick traces the characters of the Post-Aristotelian Schools. He notes the

growing diversity between the morality of the philosopher and that of the common man,—alike in the Stoic who erects an impassable barrier between the one thing needful and all other objects of choice,—the Epicurean who speaks the words of the pleasure-seeking worldling, and yet lives a life of repose amid intellectual pursuits,—the Academic who falls back on mere probability as the basis of duty,—the Sceptic who finds in the laws of his country and in his natural instincts a practical guidance, but without scientific value,—and the Neo-Platonist, who puts as the highest grade of virtue an assimilation to God, transcending even the scientific goodness of the sage. The pages treating of these sects are excellent both in form and matter. There are points on which we think differently from Mr. Sidgwick. The Anti-hedonism of Speusippus he has exaggerated: he does not bring out the common-place character of the *καθῆκον*, and the Antinomian aspects of the *κατόρθωμα*: he might have noted (p. 71) that Epictetus gives the name of Cynic to the saints of philosophy; and perhaps a little more might have been made of Marcus Aurelius's conception of man as the 'rational and social animal' and of the mind of the universe as 'social' also.

It is impossible to examine the next sections with the same detail. We have already spoken of the remarks on the contrast between Greek and Christian morality. Mr. Sidgwick follows it up by noting the difference between the philosophic view of vice as due to ignorance and the Christian theology which treated it as due to a perverted will. It is a topic on which generalities are likely to mislead: and one is sometimes tempted to think not merely that the Christian and the Pagan views intermingle, but that the difference between the two sides is sometimes more verbal than real. We cannot stop to note that there is no account of the peculiar ethics of chivalry. Still less can we delay among the English moralists from Hobbes to Bentham, and need only express our admiration of its careful thoroughness. The close of the book fails, we think, to assign to Kant his proper place in the development of English thought. That remarkable disruption in the intellectual history of English ethics which is found in J. S. Mill is only to be explained by the influence, not altogether adequately grasped, of Kant as it filtered through several minds both English and French. It is at least evident that Mill felt the want for a basis to Utilitarianism of a deeper kind than it had yet received. The question of a basis, as distinct from that of the *axiomata media*, is precisely what Kant set himself to answer: and the importance of this clear enunciation of the basis by Kant is what Mr. Sidgwick, hampered by his old antithesis between Intuitionists and Utilitarians, fails sufficiently to realise. He does not fully bring out the sense in which the rational being is an end to or in himself, and he is perilously near misconception when he presses Kant's words into an assertion "that all rules of duty must admit of being deduced from one general principle" (p. 261).

But a full discussion is here impossible: as also of his view that Hegel teaches conscientious effort to be self-deceived, if the individual fail to achieve his aim in harmony with the objective social relations in which he finds himself placed—a view by the way which is not without parallel in Mr. Spencer's assertion that 'conduct that has any concomitant of pain is partially wrong'. Mr. Sidgwick's remarks on freedom of will are good as far as they go; though the statements in p. 254 as to the standpoint of the determinist seem in need of qualification.

In parting company with this book, full of keen analyses and apt apprehensions, if not always free from the defects of its kind, we wish it many editions: and in view of such note the following little errata: p. xx., 6th line from foot, delete *the;* p. 2, 2nd line from foot, for *criteria* read *-on;* in p. 33, line 17, delete *of soul;* p. 48, line 8 from foot, read *Socraticism* (?); in p. 171, line 4, *necessarily;* p. 179, line 17, *startlingly;* in p. 201, note line 13 from foot, insert *to that* after *kind*. We may also add that a few references might be well added, or put instead of the present notes.

WILLIAM WALLACE.

The Teacher's Handbook of Psychology, on the basis of *Outlines of Psychology*. By JAMES SULLY, M.A., &c. London: Longmans, Green & Co., 1886. Pp. xvi., 509.

The Outlines of Psychology (reviewed in MIND 35 by Prof. Adamson) was written, as the title-page showed, "with special reference to the Theory of Education". Sometimes in the midst of the text, but chiefly at the end of each chapter, abundant remarks and reflections were introduced, showing the bearing of the principles of mental science upon the training of faculty and character in the young. The work has been (as it deserved to be) very acceptable to the public,—especially to students,—and it would be a great mistake to suppose that the present *Handbook* is intended to, or possibly can, supersede it. But it has been felt that the *Outlines*, in spite of its modest title, is too long and detailed, and sometimes perhaps too abstruse and difficult, for many parents and teachers, who would gladly see their task in the light of science, but either have not much time to spare, or else lack the special training that is requisite for the more intricate questions of Psychology. For them accordingly the present smaller volume has been produced.

The *Handbook* begins with a discussion of the scope of Education and of its relation to Psychology. After this preliminary chapter the book is based upon and follows generally the course of the *Outlines*, giving a succinct but luminous view of the best scientific doctrine with regard to the senses, perception, the higher intellectual powers, the emotions and volition. But the applications of the science to the problems of Education are no

longer, as in the larger work, separated from the exposition of the science itself by any difference of type or arrangement. Doctrine and precept are fused into a continuous whole, which, assisted by an openly printed page and an effective style, becomes, I must say, extremely readable, considering the nature of the subject. Upon each branch of the subject enough is said concerning the principles of Psychology to serve the ordinary purposes of the educator; and everything is said so simply that no one, however unaccustomed to such inquiries, can fail to follow and understand it. There is no attempt to enter into subtle disquisitions or vexed controversies. The bog-fires of Metaphysic, hardly seen to glimmer on the borders of the demesne, can tempt no wayfarer to go astray. Every sentence is subordinated to the single end of clearing-up the problem how best to train the minds and characters of the young. And the inferences drawn step by step as the book advances, and the suggestions made upon this most important of all subjects, are an admirable example of the application of science to life. Who can help wishing to have been born later, and to share the more enlightened instruction that awaits the next generation?

If I were to take exception to anything in the scientific aspect of this book, it would be chiefly to the treatment of Conception, Judgment and Reasoning, which seems to me too much under the influence of ordinary Logic. But even here what seems to me questionable lies more in the expression than in the thought: and there is, after all, in this part of the exposition some advantage in availing oneself of the terms and distinctions of Logic; since many readers will partly understand them to begin with, and will thereby be more readily familiarised with the abstruser ideas of Psychology. Still this advantage may be bought too dear. In the practical aspect of the book, I am inclined to say that it lays too much stress upon the importance of authority in moral training. But probably few of those for whom the book is intended will think the author's doctrine of discipline overstrict. His treatment of the emotions and sentiments in relation to education, a particularly difficult and important part of the work, seems to me especially good.

It is a striking fact, the sudden turning of so many first-rate minds to the subject of Education; and a great revolution in scholastic affairs, however gradual, will certainly result from it. No subject ought to be so universally interesting. If none seem so tedious to us, it may be because our own education was so bad; or that we have reflected so little about it that new suggestions find in our minds no soil to strike root in; or that the complexity and practical difficulties of it paralyse our faculties: in any case, the more reason for spurring ourselves to the study. There is no subject more beset with popular errors, none in which science is more useful, explanatory and suggestive. Not only every professional educator, but every father and mother (amateur

educators!) ought to have some acquaintance with Psychology. However absurd this seems, I defend it on the ground that nothing else enables one to interpret the faint and fragmentary recollections of having been oneself a child: without which how can other children be known, and, if unknown, how trained? At school I often used to wonder whether the masters had ever been to school, they knew so little of what we boys were thinking, feeling and about to do. I have heard an educated woman say of her baby, squalling of course at six months old,—"I believe he knows he's doing wrong". Heautomorphism, in default of science, is ever the first resource of explanation; *i.e.*, we judge of others by ourselves. Discipline without knowledge, and therefore without sympathy, an outside wooden machinery, hampering and crushing, is the same in schools, in homes and in prisons.

Science is certainly useful: yet it may be perverted by an ingenious mind. It has been urged that, according to the theory of evolution, education must with each generation become less necessary: I suppose, because the amount of inherited faculty grows greater. But this inheritance is only potential: its realisation depends partly on education; and the more of it there is, the more education is requisite. The truth which the above opinion has mistaken is, that the power of education is limited both for good and evil by the nature of a child. But this truth the world did not wait for the theory of evolution to reveal. The notion that character and understanding depend wholly on the experience and training of the individual was never adopted by common sense. It is everywhere recognised that no education, however good, can insure against taking one of the by-paths of the Pilgrim's Progress that man who has some deep ancestral taint—"a bad avidge" one calls it in Cornwall (however that word should be spelt). On the other hand the first rule for a successful educator is to get a good pupil. But this does not conflict with the further truth that the greater natural potency of development which accompanies civilisation, makes the teacher's task not less necessary, but (as far as it goes) more exacting, requiring greater care and skill: since first the subject to be trained becomes more complex and delicate; secondly, the time during which it requires supervision increases; thirdly, the changes occurring in it during that time are more numerous and less predictable; and lastly (not to seek further reasons), the world to which it is to be adapted grows far more complex and exigent. How rapidly the world has changed in the last 300 years, and how little scholastic education has tried to keep pace with it! So much the more desirable is it that the changes now inevitable should be made in the light of scientific criticism.

To the scientific criticism of education Mr. Sully brings every requisite. A wide reputation as a psychologist guarantees the competence of his theoretical knowledge. A deep and varied culture in science, literature and art enables him to survey the

whole field of labour. He has for a long time studied Education as a science, and in so doing has availed himself of all the work of his predecessors and contemporaries both at home and abroad. Whoever wishes to make an exhaustive study of the subject will find in the appendices to his chapters a sort of index to educational literature. Mr. Sully has moreover direct experience of the difficulties of education both in its earliest and most advanced stages. Many of the anecdotes that enliven his book bear the stamp of personal observation. And a humane and serious spirit everywhere dispenses wisdom as well as knowledge.

In this *Handbook* education is of course treated in a broad and general way, covering both the early years of training at home and the later periods at school. But there would be manifest advantages in treating these ages and conditions separately with more specific detail. Again, whilst a work of this sort begins with psychological principles and then proceeds to apply them to education, teachers might be more readily interested by the method of beginning with the particular problems and difficulties of their art, and then exhibiting the principles involved in them; or of beginning with the rules of education that have been empirically collected and handed down, and then testing and evaluating these by scientific analysis. One great difficulty of education is how to deal with the various classes into which pupils fall as to their powers and groups of powers. The same treatment cannot be good for all alike: but how to adapt it to each? We want an Ethology of the Schoolroom, somewhat more discriminative than that ethology of the assembly that Aristotle gives in his *Rhetoric*. After that would come the question, what studies and combinations were suited to each type. But the field of suggestion is wide and the labour therein light.

CARVETH READ.

Musikpsychologie in England. Betrachtungen über Herleitung der Musik aus der Sprache und aus dem thierischen Entwickelungsprocess, über Empirismus und Nativismus in der Musiktheorie. Von C. STUMPF. Leipzig: Breitkopf & Härtel, 1885. Pp. 89.

In this brochure, reprinted from the *Musikalische Vierteljahrsschrift*, Prof. Stumpf clears the ground for his systematic exposition of the psychological basis of music in the second volume of his *Tonpsychologie*. That in considering previous theories of musical expression and musical effect he should single out English writers, is a circumstance that no contributor to this Journal can object to. It may seem odd at first sight that the country which for more than two centuries has played a subordinate *rôle* in the history of music should turn out to be the one most prolific of late in speculation on the nature and sources of musical delight. But

in truth England, though supplying but few great composers, has been growingly receptive and appreciative of new musical work. This fact, coupled with the proficiency of the country in psychological reflection, may serve to account for the prominence of musical speculation in its recent literature. The attraction of the subject for Englishmen is illustrated by the fact that the two most eminent representatives of evolutional psychology, Mr. Spencer and Mr. Darwin, have each devoted special labour to the problem of explaining the emotional effects of music. Neither of these writers apparently lays claim to a technical knowledge of the subject, and it would seem that in their case the attraction of the theme lies in its peculiar obscurity and in its intimate connexion with the more general problems which they are directly concerned to resolve. In the case of other writers, however, and notably Mr. Edmund Gurney, the impulse to account for the power of music may be seen to have sprung out of a long and close study of the laws of musical structure and the wide variety of effect obtainable from accepted forms of composition. And thus it has come about that in attempting a critical estimate of recent musical psychology Prof. Stumpf finds himself apparently compelled to single out English writers for special notice.

After a brief *résumé* of earlier English writings on the subject, our author proceeds to expound and criticise the theory of Mr. Herbert Spencer as the first attempt to apply the new doctrine of evolution to the problems of music. The leading idea of this theory is that music is an idealised speech. This idea, we are told, is by no means original. Independently of the writings of antiquity and the Renaissance on the connexion between speech and music, the derivation of music from language was in vogue in France from the middle of the last century to the second decade of the present. A short sketch of such earlier forms of the theory greatly adds to the value of Prof. Stumpf's essay, though he seems to exaggerate the points of affinity between Mr. Spencer's doctrine and that of writers like Rousseau and Diderot. The one writer who, according to this historical *résumé*, really anticipated Mr. Spencer was G. A. Viloteau, who in 1807 published two stout volumes on the analogies of music with the arts that have as their object the imitation of language. Of the correctness of this theory Prof. Stumpf takes much the same view as Mr. Gurney, whose strictures he here reproduces approvingly. Music and speech are, he tells us, sharply differentiated from one another by the circumstance that the intervals of the one are fundamentally unlike the variations of tone of the other. In speaking, a slight shifting of pitch, say a quarter tone, makes no difference in the effect, whereas in rendering a musical composition such a change would instantly be felt to be fatal to the desired effect. A singing manner of speaking instead of being effective is commonly pronounced disagreeable. Not only so, speech is accustomed to move through what seem to our ear continuous transi-

tions. And it is impossible to explain historically the development of modern musical intervals out of these slight movements of tone in speech. The hypothesis of a *tertium quid* between singing and speaking, such as has been attributed to the Greeks and other early peoples, seems therefore to our author to be an absurdity. While, however, denying that music is an outgrowth from language, Prof. Stumpf allows more weight than Mr. Gurney to the effect of analogies between the two when they are both in existence. In vocal and even in instrumental music he recognises the transference of feelings from the region of emotional language. And his fuller technical knowledge enables him to add that the rules of musical execution, especially in the case of the violin, were developed under the influence of the perception of these analogies. At the same time these links of association between speech and music cannot be said to explain the whole or even the main charm of music. This has a purely musical origin, *viz.*, the combination of intervals in certain agreeable forms.

Prof. Stumpf next examines my own contributions to the psychology of music. The attempt to combine Mr. Spencer's theory of musical expression with Helmholtz's doctrine of musical sensation seems to our author a singularly unhappy one. The recognition of intrinsically beautiful aspects of musical combinations makes it unnecessary, he thinks, to call in the aid of associations with speech, which moreover ought, *ex hypothesi*, to lose more and more of their effect as the art of music develops. The writer directs his criticism more especially against my account of the effect of musical harmony. He insists on the necessity of distinguishing between the sensation and the feeling of harmony, the former of which is always the same for a given interval, whereas the second varies considerably according to the special connexion in which this combination appears.

Having disposed of the speech-theory Prof. Stumpf turns to the doctrine of Mr. Darwin, according to which music owes its effect to the fact of its being an outgrowth from the vocal accompaniments of the wooings of our semi-human ancestors. It follows from this, says our critic, that the emotional power of music must be continually declining. He then proceeds to examine the theory. He objects in the first place that the basis of fact is wholly inadequate. Animal sounds serve other purposes than that of alluring the female, *e.g.*, warning. And if we seek to derive musical effect from animal experience, why should we not take into account these other functions, more particularly the part played by sound as the expression of mere delight? Moreover the instances of wooing sound relied on by Darwin are not drawn from animals in the same line of development as man, whose immediate predecessors, indeed, appear to be singularly backward in the production of musical sounds. Again, says Prof. Stumpf, Mr. Darwin is compelled to postulate that certain sequences of tone are originally agreeable while others are

disagreeable; but if so, what is to hinder this agreeable effect from reaching the intensity of what we recognise as musical delight? There are, it is true, grounds for thinking that this delight is not wholly the immediate accompaniment of melodic combination, but if so, it would be better to seek the mediate link in the mental life of the individual than in the problematic experience of remote sub-human ancestors. Even on its own ground the Darwinistic theory encounters serious objections. If the history of the individual epitomises that of the race we should, according to Darwin's account of musical delight, expect this to be much greater in the child than in the adult. If, further, we inspect the quality of musical feeling we find that it contains little if any trace of those voluptuous sensations which according to Darwin make its chief ingredient. The emotional effects of music are too various and uncertain to be explained in this easy manner. As a final objection, our critic urges that the so-called animal music cannot strictly be regarded as music in our sense. He thinks that the attempts to render the song of birds, &c., in our musical notation are forced. So far as we can judge, animals find their joy in tones as such and not in intervals. Here Prof. Stumpf seems to me to be less impartial than usual. If, as seems certain, there is a predominance of good musical intervals in the song of our favourite warblers, this ought surely to count as evidence of a genuine musical taste.

The last part of the essay is taken up with an examination of Mr. Gurney's important work, of which it seems he had knowledge before the present writer in this Journal ventured to call his attention to the treatise. As might be expected from his attitude towards the pure evolutionists, our author is to a large extent in sympathy with Mr. Gurney's views. He recognises in him a *Fachmann* who is competent to deal with the subject. More particularly he evidently approves and enjoys the Englishman's fine and penetrating criticism of received theories. Yet with the main outcome of Mr. Gurney's reasonings he is wholly at variance. To pronounce musical impressions to be unanalysable and to fall back on the hypothesis of a unique musical faculty appears to our author to be to abandon the musical problem altogether. Mr. Gurney's "crass nativism" is subjected to a severe criticism in which the writer displays his gifts of skilful analysis and nice logical appreciation at their best. And he is no less forcible in trying to show that Mr. Gurney, who recognises in the delight of music something more than a merely sensuous pleasure, *viz.*, the appreciation of melodic form or ideal movement, has no excuse for following Mr. Darwin in his recourse to the emotional experiences of primitive man. Of the difficulties of combining these two points of view Prof. Stumpf makes the utmost. It is in Mr. Gurney's version of the Darwinian theory that the contradiction of a growing instead of a declining musical delight as the art advances becomes most patent and

unavoidable. On the details of Mr. Gurney's exposition, such as the difference between music and architecture, our critic has pertinent and valuable observations. He urges that, though it is impossible to receive the different sensuous moments of tune, melodic interval and rhythm in isolation, this does not prevent our approximately estimating the emotive value of each. He concedes much to Mr. Gurney as to the organic unity of each new musical creation, and yet he shows how in every case we are able to some extent to refer the pleasing result of the whole to definite elements. The source of Mr. Gurney's error, says our critic, is a strong scepticism as to the things of psychology, and along with this a credulity as to the things of acoustics. In order to establish this more fully, he examines Helmholtz's theory of harmony, which is in a measure accepted by Mr. Gurney as by myself. He tells us that this doctrine has for the last twenty years excited more and more opposition in Germany, and that it will finally have to be given up. Though the upper or partial tones have a determining influence on the timbre of a tone, they have none or only a very subordinate one on consonance and the feeling of harmony. According to Prof. Stumpf, consonance consists in the tendency of tones to coalesce (a "Verschmelzungsverhältniss"), and the pleasurable feeling of harmony springs in the first place out of the perception of this relation, though it is reinforced by other ideas and feelings that attach themselves to this perception. But the author's own theory is too briefly suggested to be quite intelligible.

As may easily be seen from this brief sketch of Prof. Stumpf's argument, its drift is to lift musical enjoyment above the level of mere sensuous pleasure, and at the same time to rescue it from the domain of the unconscious, whether conceived of as obscure reminiscence of ancestral feeling or as a process of unconscious computation. Prof. Stumpf has a wholesome love of clear daylight and clings to the belief in the explicability of things. In dealing with the mysteries of musical emotion he has had to subject this conviction to the severest strain. He seems to confess that we can at present only very imperfectly discern the different threads of consciousness that are intertwined in the impression produced by music. And in spite of his direct attack on Mr. Spencer's theory, he appears, as we have seen, to attribute no inconsiderable part of the effect of music to associations with speech. The main point of difference between him and Mr. Spencer seems to be that he would set little store by heredity, but view such associations as built up during the life of the individual by means of a separate experience and comparison of each. Here Prof. Stumpf is taking up safe ground. Yet it strikes one as arbitrary to exclude altogether the co-operation of inherited association here. The common view is that primitive speech exhibited quasi-musical changes of tone much more abundantly and distinctly than our modern highly evolved speech; and it

seems not improbable that vague reminiscences of such more marked vocal expression enter into the effect of music on the modern mind. The fact that the later music has in its elaborate structure wandered far from its primitive pattern is no serious objection to this view; for, as Prof. Stumpf points out, our music distinctly preserves elements, such as rising and falling of pitch, crescendo and diminuendo, which have a clear analogy to the movements of emotional speech. It strikes one further that Prof. Stumpf disposes too lightly of the supposition that music gradually disengaged itself from speech by a process of selecting and fixing the intervals which dimly disclosed themselves in primitive emotional utterance. One may safely say that much more definite knowledge of the manner in which primitive man spontaneously employed and inflected his voice is needed before one can confidently pronounce a negative here. And in this connexion I may call attention to a point which our author seems to have overlooked, *viz.*, the well-marked musical character of the first baby-vocalisation. The la-la-ing of the infant suggests that uncivilised man may have begun with a rude kind of song before he found his way to our more monotonous style of articulation.

This essay makes one impatient to know how Prof. Stumpf will deal with the subject of musical emotion when he proceeds to take it up in his systematic exposition of musical psychology. For after all the brochure is in the main a criticism, and the author's own views are only vaguely indicated. As a piece of painstaking inquiry into current theories it deserves the highest praise. Prof. Stumpf has mastered the views he examines, and no one can charge him with serious misrepresentation. And his criticism, while incisive and unsparing, is tempered with a true courtesy.

JAMES SULLY.

VII.—NEW BOOKS.

[*These Notes (by various hands) do not exclude Critical Notices later on.*]

Psychology. The Cognitive Powers. By JAMES M'COSH, D.D., &c., President of Princeton College. London: Macmillan & Co., 1886. Pp. vii., 245.

This is the first volume of a work on Psychology which the author hopes to complete by a second on "the Motive Powers of the Mind, including the Conscience, Emotions and Will" (partly anticipated by his work on the Emotions). "The study of the human mind in an inductive manner" leads us, he thinks, "to Realism, which in a rude state was the first philosophy, and when its excrescences are pruned off will be the last." This realism is qualified by the stress laid on the limited character of our "original" as distinguished from our "acquired" perceptions and memories; and no difficulty is felt, for example, in incorporating the results of modern investigations of sense-perception from Berkeley onwards. In the Introduction (pp. 1-17) the subject and method of study are defined, and the traditional terminology of mental "faculties" and "powers" is defended with qualifications. The author then goes on to deal, in three Books, with "The Simple Cognitive or Presentative Powers" (pp. 18-86), "The Reproductive or Representative Powers" (pp. 87-207), and "The Comparative Powers" (pp. 208-45). Under the second head he gives an account of the laws of association. Two "primary laws" are recognised,—"contiguity" in space and time, and "correlation". The eight "relations" which may form the ground of association are considered in detail in Book iii. Within the scope of the "comparative powers," and among those especially of "the faculties which discover the relations of Identity, Comprehension and Resemblance," are brought the "discursive operations" of "Simple Apprehension, Judgment and Reasoning" (c. iii.).

The Social Problem in its Economical, Moral and Political Aspects. By WILLIAM GRAHAM, M.A., Professor of Political Economy and Jurisprudence, Queen's College, Belfast, Author of the *Creed of Science.* London: Kegan Paul, Trench & Co., 1885. Pp. xx., 479.

This eloquent book (divided into four parts—"The Social Problem and its History," "The Existing Distribution of Wealth and Work," "Property and Inequality of Wealth," "Special Remedies") does not properly fall within our province, but may be mentioned here because of its main conclusion that all conceivable "remedies" for the ills that threaten society (as never before) with universal collapse, run up, in the author's view, into moral considerations—"turn finally on the question, Can man be made morally better?" and also because of the work he has previously done of a more directly philosophical cast. Apparently he has now forsworn his earlier allegiance, for he gives it as one of the signs of hope for the future that "Philosophy—dropping her mill-horse round of thrashing exhausted metaphysical issues—is turning her eyes to earth, is condescending to regard that remarkable entity called Society; a thing well worthy her regards if only for a change, now that long familiarity with the Absolute must at last have produced a sense of monotony from want of variety" (p. 466). This is somewhat rhetorically said, like what is earlier (p. 21) remarked of the "metaphysical" vagaries of "modern prophets . . . . from Hobbes and Locke to Bentham, Mill and Carlyle".

The Philosophy of Religion on the Basis of its History. By Dr. Otto Pfleiderer, Professor in the University of Berlin. Translated from the German of the Second and greatly enlarged Edition by Alexander Stewart, M.A., and Allan Menzies, B.D. Vol. I., "Spinoza to Schleiermacher". London and Edinburgh: Williams & Norgate, 1886. Pp. xii., 340.

Dr. Pfleiderer's important work, in its second enlarged edition, has so lately (in Mind, Vol. x. 285) been made the subject of Critical Notice, that it is enough to simply welcome this first instalment of an English rendering of it. The translators have brought trained intelligence to their task, and executed it (so far as we have been able to test) with exemplary care. The translation will be in three volumes, the handiness of which should make up for abruptness in the division (substituted for the natural bisection of the original).

Scientific Romances. No. III. "A Plane World"; No. IV. "A Picture of our Universe". By C. H. Hinton, B.A. London: Swan Sonnenschein, Lowrey, 1886. Pp. 129-159; 161-204.

Mr. Hinton here continues the series of scientific speculations (with a more or less philosophical purpose) begun with the pieces noted in Mind 39, 40. As in his earliest paper "What is the Fourth Dimension?" his thoughts here turn upon the subject of "a space higher than our own," and, regarding the subject as one that "is becoming felt as serious and fraught with much that is of the deepest interest, not only as a scientific problem, but in other ways also," he seeks to work up to it first by a detailed consideration of a simplified plane world (which others, with various motives, have before imagined), and then by a free conception of the world of our actual experience.

La Psychologie de l'Enfant; L'Enfant de trois à sept Ans, par Bernard Perez. Paris: F. Alcan, 1886. Pp. xi., 307.

In this volume M. Perez follows up his well-known study, *Les trois premières Années de l'Enfant*, and completes his psychological account of the child. Like the earlier work it is divided into chapters dealing with distinct psychical processes, as Memory, Imagination, Abstraction, Attention, the Feelings. The author clearly recognises the special bearing of this period of mental development on the art of Education, and throughout he seeks to give a practical turn to his exposition of psychological principles. At the same time he tells us that his principal aim has been psychological and not pædagogical. Critical Notice will follow.

La Criminalité comparée. Par G. Tarde. Paris: F. Alcan, 1886. Pp. vii., 214.

The author has here brought together some of the very interesting and striking discussions on the phenomena of crime which he has from time to time published in the *Revue Philosophique*, and, in view of the practical urgency of the subject in France as in other countries at the present time, has developed them into the form of a relatively complete treatise. He mentions, however, the fact of importance, for those who wish to study the subject in minutest detail, that his very enterprising publisher is about to issue a (French) translation of Lombroso's *L'Uomo delinquente* (3rd ed., 1884), the most remarkable product of the Italian school, which has so long been distinguished for its forward inquiry in this particular field. M. Tarde takes up an independent position as regards Lombroso's thesis that the modern criminal is the atavistic representative of the primitive savage, and also otherwise; writing always as a man with a philosophical

point of view of his own. "Criminology" he regards as the complement or reverse of Political Economy (in its newer socialistic form), both falling within the general doctrine of Sociology. The little treatise is worthy of all attention.

Il Cristianesimo primitivo. Studio storico-critico di BALDASSARE LABANCA, Professore di Filosofia morale nella Università di Pisa. Torino: E. Loescher, 1886. Pp. xxiv., 448.

The chapter of most philosophical interest in this work, which is intended chiefly as a historical and not as a philosophical study, is the sixth (pp. 209-268), on the relations of ancient philosophy to primitive Christianity. The author has in view to follow up this volume by another, dealing with "Christian Philosophy in relation to primitive Christianity, in its most important problems, historical and scientific". The book is inscribed "to Giordano Bruno, the martyr of free thought".

FRIEDRICH UEBERWEG'S *Grundriss der Geschichte der Philosophie.* Erster Theil: "Das Alterthum"; Zweiter Theil: "Die mittlere oder die patristische u. scholastische Zeit". Siebente, mit einem Philosophen- u. Litteratoren-Register versehene Auflage bearbeitet u. herausgegeben von Dr. MAX HEINZE, ord. Professor der Philosophie an der Universität zu Leipzig. Berlin: E. S. Mittler, 1886. Pp. ix., 360; viii., 305.

The first two parts of Ueberweg's standard work, last issued in 1880-1, here reach their seventh edition. Prof. Heinze, who has now so long been charged with the laborious task of keeping the book on a level with the most recent special inquiry in all parts of the field, has worked again in an effective manner, incorporating the necessary references to the newer literature, often with critical observations; and yet, in the case of Part i., managing, by occasional curtailments and omission of antiquated references, to come off with an increase from the 6th edition of only some 20 pages. Part ii. is even less extended in the gross, but now compasses its fifteen centuries much more adequately than when Ueberweg first went over them in but two-thirds of the space. The editor here proceeds upon original study of his own as well as the work of others; he regrets that he has been able to utilise vol i. of A. Harnack's new *Lehrbuch der Dogmengeschichte* only for his final revise.

Wörterbuch der philosophischen Grundbegriffe. Von Lic. Dr. Fr. KIRCHNER ("Philosophische Bibliothek," Hefte 314-9.) Heidelberg: G. Weiss, 1886. Pp. 459.

This work is by the same indefatigable and versatile author whose *Catechism of Psychology* and (so-called) *Catechism of History of Philosophy* have been noticed in former Nos. of MIND. It was not possible to judge as favourably of the second of these manuals as of the other, written so obviously as it was in very hot haste. The present work, in which the author uses over again his historical knowledge in the altered guise of a dictionary of philosophical terms, also gives the impression of being somewhat over-rapidly put together. It has been first issued in the form of three double-parts of the cheap and varied collection of philosophical masterpieces (and of commentaries on them) published under the direction of J. H. v. Kirchmann for a considerable time past. Of the usefulness of a handy philosophical dictionary there can, as the author rightly says, be no question; and he has shown himself, were it only by the very range of his former writings, by no means devoid of the qualifications for writing one that should really *prove* useful. He states his objects to have been—(1) to treat the most important philosophical notions, (2) to aim at the utmost possible

brevity and precision, (3) to track all the more important notions along the course of the history of philosophy. What strikes one most in the execution is the inclusion of so many words of merely popular interest, to the exclusion of not a few 'words of art' for which the philosophical student will look in vain: thus, though there is an article *Beispiel* giving *Exemplum* as synomym, *Exemplum* gets no mention in its place (where it would be looked for) nor does the original *Paradeigma* appear to get any mention at all. *Paradeigma* suggests the parallel *Enthymema* to the Aristotelian student, and here one is surprised, among many (? too many) meanings assigned, to find no reference to Aristotle's original meaning of the word. In another vein, *Association* cannot be said to be very adequately touched on the historical side when we are only told that "already Plato and Aristotle speak of it, but first the later psychology, especially Herbart (1776-1841), has investigated it thoroughly". Of Hartley, Hume and all the English, not a word! Yet there are many interesting things brought together in these pages. The author should gird himself to a very strenuous revision and recasting in that second edition to which he looks for reparation of shortcomings.

Das Problem der Gewissheit. Grundzüge einer Erkenntnisstheorie. Von Dr. FRANZ GRUNG. Heidelberg: G. Weiss, 1886. Pp. 205.

This work on the theory of certitude, which is to appear shortly in Norwegian, the author's native language, as well as in German, is divided as follows:—i. "Certitude" (pp. 1-29); ii. "Historical Survey of the doctrine of Certitude," from antiquity to the most recent times (pp. 30-100); iii. "The Elements of Certitude," including certitude of (1) perception, (2) thought, (3) memory (pp. 100-153); iv. "The Forms of Development of Certitude," including (1) "immediate," (2) "scientific," (3) "personal" certitude (pp. 154-184); v. "The Criterion of Certitude" (pp. 185-205). The author finds that certitude is always "a combination of will and reason". The power of the will in relation to the activity of thought is, however, entirely negative; it cannot create, it can only hinder. This negative influence of the will does not proceed from "a single arbitrary decision," but from "will in the immediate feeling of its interest". Since will cannot be directly controlled by knowledge, but only by another act of will, the question becomes, "What direction ought to be impressed on the voluntary activity in order that truth may be attained?" The answer is that the will must be cleared of all special interests and directed only by a sense of the interests of mankind as a whole. There is no general criterion of truth, for "our knowledge may always be an illusion," but only of "certitude". The criterion of certitude is the absence of self-contradiction. The logical laws are the test of "the form of certitude"; the test of its content is experience. How then shall we resolve the conflicts that have arisen, in the philosophical schools, between experience and logic? In this way: the criterion must be finally fixed as "absence of contradiction of given experiences". To the "centrifugal tendency" that carries the mind beyond the limits of the special experiences in question at the time into the realm of general presuppositions, of "concepts," is to be opposed the "centripetal tendency" constituted by the mind's feeling of its limitation. There may remain "contradictory concepts," and certitude is not destroyed; but there must be no "contradictory experiences".

Moderne Versuche eines Religionsersatzes. Ein philosophischer Essay von Dr. H. DRUSKOWITZ. Heidelberg: G. Weiss, 1886. Pp. 90.

This is a critical exposition of some modern attempts to find a "substitute for religion" which shall be to the mass of mankind what the historical

religions formerly were. The author lays down as a condition of any successful attempt of this kind that it shall render possible an attitude towards the universe that combines the feelings of "dependence," "reverence" and "trust". Man is not to be regarded as alien to nature but as a part of nature. The attempts examined are those of Comte, Mill, Feuerbach, Nietzsche, Duboc, Dühring and W. M. Salter (of Chicago). Different elements of the complete conception are found in each writer; but no attempt seems to the author quite successful as a whole. All the writers discussed regard themselves as seeking "a new religion" instead of "a substitute for religion". This last, however, is the correct name for the object of search. Again, each attempt has the limitations of the religions of the past in that it is directed too exclusively to an ethical ideal. The final conception that is to take the place of religion must be that of a complete, not merely an ethical, ideal, pursued for its own sake (as being the end of Nature, of which man is part) and not for the sake of the happiness to be attained.

Ein neuer Paulus. Immanuel Kant's Grundlegung zu einer sicheren Lehre von der Religion, dargestellt von Dr. HEINRICH ROMUNDT. Berlin: Nicolaische Verlags-Buchhandlung (R. Stricker), 1886. Pp. viii., 309.

This "simplified and extended exposition of Kant's *Religion within the limits of Pure Reason*" is a sequel to the author's books on Kant's theoretical and practical philosophy (see MIND, Nos. 40, p. 626 and 41, p. 134). Here Dr. Romundt's object is to demonstrate Kant's essential agreement, in teaching the doctrine of "the justification of man, not by works but by *practical* faith in the archetype of morality in its complete perfection," with "the German Church reformers of the 16th century, and not only with them but also with the apostle Paul". The great achievement of Kant was to give Pauline Christianity a secure philosophical foundation. His religious doctrine is not open to the objection that it "remained mere morality," but it certainly begins with morality. The conclusion of Kant's whole philosophy of religion, in his own words, is "that it is not the right way to proceed from grace to virtue, but rather from virtue to grace" (p. 292).

Religionsphilosophie auf modern-wissenschaftlicher Grundlage. Mit einem Vorwort von JULIUS BAUMANN, o. ö. Professor an der Universität Göttingen. Leipzig: Veit & Co., 1886. Pp. vi., 230.

This posthumous work of an anonymous author is briefly introduced by Prof. Baumann, who points out that "all formal conditions of scientific investigation" are fulfilled in it, and at the same time draws attention to the original qualities which make it fit to act as a "ferment" in the present state of religious thought. The author's principle of explanation of religions is the disposition of man "to comprehend all things instinctively in analogy with himself". An examination of the nature of man, as revealed by "physiological psychology," shows how the religious interpretation of nature took the different historical forms that it has actually taken. From the scientific point of view, the essentially subjective conception of nature that is characteristic of all religions has no significance. This does not mean, however, that it is valueless, but only that its value is of the "æsthetic-practical," not of the scientific, order. Just as we do not make the attempt to cease hearing sounds or seeing colours although we are convinced that they are there only in feeling, so the scientific view of religion must not be allowed to destroy religious ideas as they exist psychologically. To attempt to *see* the heavenly bodies in accordance with the Copernican instead of the Ptolemaic theory would be profitless, and indeed injurious; and so it is for anyone to try to check the tendency to religious

mysticism when it is present, or to create it when it is absent. Each individual should give himself up to his own (admittedly) subjective religion as to the contemplation of works of art or to the enjoyment of nature or of poetry; but with a view to the good practical effect on himself of belief in that conception of nature that he prefers; and keeping in mind, whenever it is necessary, the true scientific interpretation of religious feeling. Prof. Baumann tells us, as the only fact that has been communicated to him with regard to the author, that by not detaching himself from "religious Protestantism" he furnished an example of that "doubleness of the practically immediate and theoretically reflective attitude towards religion" which (he goes on to remark) in India is not unheard of but is at present somewhat surprising in Germany.

Ideale und Güter. Untersuchungen zur Ethik. Von Dr. G. CLASS, o. Professor der Philosophie in Erlangen. Erlangen: A. Deichert, 1886. Pp. vi., 188.

The author aims at laying the groundwork of an "ethics" which shall be not merely a "moral philosophy" but a "philosophy of all spiritual life". Under ethics, in this extended sense, come as "subordinate disciplines" (1) philosophy of religion, (2) philosophy of law and morals, (3) philosophy of civilisation. The author's ethical theory is "in the widest sense a theory of the good". "Good" consists in the regulation of life in accordance with commands embodied in religion (and derived from whatever theory of the universe is held to be true), in human law, and in the requirements of civilisation (especially the requirement of the subordinated activity described by the term "work" in its economical sense). "Evil" consists in the attempt to attain freedom by revolt from any of these conditions. Besides this distinction, which marks off the ethical sphere from that which is outside ethics and opposed to it, there is a distinction within ethics itself—that of "higher" and "lower". The "lower" or "natural" activities are those by which various "goods" are sought as means to personal satisfactions; while the "higher" activities are those that are directed towards "ideals," which are ends-in-themselves. There are therefore two classes of ethical imperatives: (1) conditional imperatives that command the pursuit of "goods"; (2) unconditional imperatives that command the pursuit of "ideals". "The object of ethics is accordingly the sum of internal and external work through which individual personalities bring about the supremacy of the higher over the lower." The ultimate (never completely attainable) end of ethics is "an equilibrium of the spiritual life on its practical and theoretical sides". On the practical side, that which is highest is a "pure ideal action" done for its own sake; on the theoretical side, "pure thought".

Ideen zur praktischen Philosophie. Von RICHARD WALLASCHEK. Tübingen: H. Laupp, 1886. Pp. iv., 156.

This book is divided into two sections, the shorter of which (pp. 1-44) deals with "Religion," the longer (pp. 45-156) with "Morals". In the first section, from consideration of the history of religions, the author arrives at the conclusion that "Religion is nothing else than the sum of those primary germs which in their development and independence present themselves to us as Art, the State, Morality and Law, Philosophy and Science". The second section consists chiefly of criticisms of ethical doctrines, especially those of Locke, Kant, Herbart, Hegel and Lotze. The author argues against the retention of the term "freedom" in morals; contending that, since morality implies constraint by something external, "freedom and morality are incompatible". The most satisfactory outline of an

ethical system up to the present time appears to him to be that of G. H. Schneider in *Der menschliche Wille;* but he finds much to criticise here also. At the end of the volume the domain of ethics is marked off from that of æsthetics. It is found that "the æsthetic and moral moments develop in like progression, and there is only then a perfect moral state when there is a perfect æsthetic state". The first stage of development of the spirit, therefore, must be that which contains both art and morality in germ. This, as has already been seen, is religion. When all the products of religion are completely developed, it ceases to exist as a separate thing.

Zur Lösung des metaphysischen Problems. Kritische Untersuchungen über die Berechtigung und den metaphysischen Werth des Transcendental-Idealismus und der atomistischen Theorie. Von H. BENDER. Berlin: E. Mittler, 1886. Pp. viii., 176.

The author's object is to revise Spinoza's doctrine of substance in the light of the Kantian criticism, and at the same time to incorporate with it modern "atomism". He begins with a justification of the thing-in-itself as a legitimate part of the Kantian doctrine. "The true thing-in-itself," he concludes, can only be Spinoza's "substance," "the most perfect being"; of the nature of which, however, as the Kantian criticism has proved, there can be no positive knowledge (pp. 1-43). An examination of Kant's doctrine of the ideality of space and time (pp. 44-93) leads him to "a moderate idealism". Space and time are to be regarded as "forms of representation," but also as "forms of the representation of objectively real relations". "The atomistic doctrine" is found to be logically justified as a scientific conception, but to require completion by a (non-materialistic) metaphysics (pp. 94-142). From the metaphysical point of view, it is "the scientific bearer" of that "uniformity of law" by which the one substance, the *natura naturans* of Spinoza, manifests itself in all the changes of particular things. Finally, the author contends that the three "original categories" are "substantiality, causality, and reciprocal action" (pp. 143-76).

Optische Häresien. Von ROBERT SCHELLWIEN. Halle a. S.: C. E. M. Pfeffer (R. Stricker), 1886. Pp. iv., 98.

The author, whose philosophical doctrine is set forth in works noticed in MIND, Vols. ii. 134 and iv. 602, here contends for the objective existence of colour as a quality of things, and not (as it is often represented by physicists) a mere "subjective" product of the interaction of organism and ethereal vibrations. Mechanical movement, he contends, has no claim to be regarded as objective in a special sense. The sensible world is throughout a manifestation of the real world. To attempt to explain colour by interaction of ethereal movements and of the organism (or of "consciousness") is illusory. "Light and colour *are*, are objectively effects and modes of existence of things." As such, they must be explained on objective grounds. Experiments on polarisation and contrast lead to the conclusion that not only different colours but also 'bright' and 'dark' form "a polar contrast". This contrast physiological optics tries to explain on subjective grounds, detaching it from its objective basis. The true explanation is that in the objective reality of things there is a "genetic and polar process" through which light proceeds from darkness and darkness from light; and in the transitional stages of this process colour originates, "which itself again belongs to a polar contrast, according as it is transition from light to dark (blue and violet) or from dark to light (red and yellow) or the union of these contraries in the bright mean (green) or in the dark mean (purple)" (p. 73). The consciousness of colour leads us back immediately to its real

basis. For "the content of consciousness is the thing-in-itself"; being is in its essence consciousness; and "our physical life and our psychical activity are only different functions of the same substantial cause".

Beiträge zur Analyse der Empfindungen. Von Dr. E. MACH, Professor der Physik an der deutschen Universität zu Prag. Mit 36 Abbildungen. Jena: Gustav Fischer, 1886. Pp. vi., 168.

Ueber die Psychophysik. Physikalische und erkenntnisstheoretische Betrachtungen. Von Dr. ADOLF ELSAS, Privatdocenten der Physik an der Universität zu Marburg. Marburg: N. G. Elwert, 1886. Pp. vii., 76.

Prof. Mach's present series of papers continues his psychophysical work by investigations on the sense of space, of time and of tone. He here contends for a "principle of the complete parallelism of the psychical and physical"; which may, if we like, be accepted merely as "a heuristic principle," but must in any case be postulated. His mode of conceiving this principle requires "proportionality of stimulus and sensation," and so determines the rejection of Fechner's logarithmic law (p. 38). It was, however, from the *Elemente der Psychophysik*, as he tells us, that he received, twenty-five years since, the most powerful impulse towards investigations such as these. The present researches are preceded and followed by sections dealing with the more general aspects of the author's work. Scientific conceptions, he holds, may be viewed as "economical means," that is, means of comprehending natural phenomena with the least expenditure of labour. He notes (p. 141) the resemblance of this view to that which is developed by Prof. W. James in his article on "The Sentiment of Rationality," in MIND, Vol. iv. 317.

Dr. Elsas, criticising Fechner's law in detail from the point of view of mathematical physics, arrives at the conclusion that it is not correctly deduced. Further, he contends that a "psychophysics," in Fechner's sense, is impossible. Feeling is in no way an object of scientific knowledge; "it does not belong to nature; it has for the mathematical physicist no reality; it does not allow itself to be treated mathematically as a quantity".

Leo Hebræus, ein jüdischer Philosoph der Renaissance; sein Leben, seine Werke und seine Lehren. Von Dr. B. ZIMMELS. Breslau: W. Koebner, 1886. Pp. 120.

This is an account of the Jewish philosopher Don Judah Abarbanel (b. 1460-3, d. 1520-35), better known as Leo Hebræus, whose *Dialogues on Love*, written originally in Italian and afterwards translated into French, Spanish, Latin and Hebrew, have some importance in the history of the Platonism of the Renaissance. An Introduction on "Leo Hebræus and his Times" (pp. 1-15) is followed by sections dealing separately with his life (pp. 16-47), which was even more eventful than the lives of philosophers of the period usually were; his works (pp. 48-66); and his philosophical doctrines (pp. 67-120). Leo was one of the philosophers who tried to reconcile Plato and Aristotle. According to Munk, it was "under the auspices of the Kabbalah" that this reconciliation was attempted; but the author contends that with Leo "Kabbalah" only means "tradition" (as embodied in the Talmud and other post-biblical writings). From the frequency of the expression "intellectual love" in Leo's dialogues, he conjectures an influence on Giordano Bruno and Spinoza (see note, pp. 74-9). In distinction from the Jewish Scholastics, who tried to show everywhere the identity of orthodox Judaism and Aristotelian philosophy, Leo made a division between faith and scientific reason; maintaining the equal truth of both, each in its own sphere (pp. 81-3).

Die Psychologie der Stoa. Von Dr. LUDWIG STEIN. Erster Band. Metaphysisch-anthropologischer Teil. Berlin: S. Calvary & Co., 1886. Pp. 216.

This first volume of a monograph on the psychology of the Stoics, by the author of *Die Willensfreiheit und ihr Verhältniss zur göttlichen Präscienz und Providenz bei den jüdischen Philosophen des Mittelalters* (see MIND, Vol. vii. 157), leaves nothing to be desired in fulness of information and minuteness of reference. The author regards Stoicism as, in spite of its apparent eclecticism, the most independent school of post-Aristotelian philosophy. This independence is nowhere more evident than in its psychology. The philosophy of Kant, it has been rightly said, knew no psychology. Of the Stoic philosophy precisely the contrary is true; for it is on psychology that its whole system essentially rests (p. 12). In the present volume the subject-matter is treated under the main heads of "Metaphysics" (part i., pp. 1-86) and "Anthropology" (part ii., 87-205). There is also an appendix on "The Microcosm and Macrocosm of the Stoic school" (pp. 205-14). A special feature of the work is that, in addition to the treatment according to the subject, there are detailed studies of the doctrines of the individual chiefs of Stoicism (pt. i. cc. 5-8, pp. 54-86, "Zeno," "Cleanthes and Chrysippus," "The Later Porch"; pt. ii. cc. 11-14, pp. 151-205, "Zeno," "Cleanthes," "Chrysippus," "Middle and New Stoics").

Abriss des Systemes der Philosophie. Von KARL CHRISTIAN FRIEDRICH KRAUSE. Herausgegeben von Dr. PAUL HOHLFELD und Dr. AUG. WÜNSCHE. Leipzig: O. Schulze, 1886. Pp. vi., 210.

This is the first complete edition of K. C. F. Krause's *Abriss des Systemes der Philosophie*. Part i. (pp. 1-95) was published in 1828, and a second edition has since appeared, corrected according to Krause's manuscript remarks. Part ii. (pp. 97-210) has not been printed before. The laborious work of deciphering the MS. and putting it into order has been undertaken and carried through by the editors "in the unshakeable conviction of the imperishable worth of this outline, of the eternal truth of the 'Wesenlehre' generally".

Logik. Von Dr. FRIEDRICH HARMS, weil. ord. Professor der Philosophie an der Universität zu Berlin. Aus dem handschriftlichen Nachlasse des Verfassers herausgegeben von Dr. HEINRICH WIESE, ev. Pfarrer in Triebusch. Leipzig: Th. Grieben (L. Fernau), 1886. Pp. xii., 308.

Former works of the author have been noticed in MIND, Vols. ii. 133 and iii. 292. This posthumous *Logic* is in two parts, of which the first ("The Conception of Logic," pp. 1-57) is concerned with the relation of logic to general philosophy, the second (pp. 58-269) with the "System of Logic" itself. There follow notes (pp. 270-308) which are for the most part marginalia of the author. His general view is that logic is not merely a propædeutic to philosophy, but is a part of philosophy itself, forming with metaphysics or ontology a "Wissenschaftslehre" distinct from the special sciences on the one hand, and from the remaining philosophical sciences of "physics" and "ethics" on the other. Metaphysics deals with the object of knowledge, with "being," and so with the presuppositions, fundamental conceptions and axioms common to all the "sciences of experience". Logic deals with the same object-matter from its own point of view, which is that of "the knowing subject". Metaphysics, therefore, cannot be independent of logic; for we can only determine the being of an object, what the object is, in so far as we know it. Experience is for logic and metaphysics a unity,—the unity of thought and being. For physics and ethics it is a duality. All experience falls into two kinds, "internal" and "external".

The first kind is the subject of the "historical," the second of the "natural" sciences. "Physics" deals with the general presuppositions of natural science, "ethics" with those of historical science. Formal logic, being for the most part an empirical science founded on observation of the actual process of (verbal) thinking, is only a propædeutic of philosophy. To become a "philosophical science" it must be extended into a general doctrine of scientific method. Psychology and anthropology contain both a propædeutic and an application of philosophy; but they cannot replace systematic philosophy itself, which is a presupposition for applied, an end for propædeutic, philosophy. Logic as philosophical science is divided into the "Doctrine of Elements or Principles," or "Analytic of Knowledge," and the "Doctrine of Method," or "Synthetic". Its "final principle" is the conception of knowledge as a totality or unity; its "real principle" or starting point is "intuition"; then, since thought, starting from intuition, knows truth, which yet is not in intuition itself, a third principle is required, *viz.*, the activity of thought in knowledge (Erkenntnisskraft des Denkens). This determines a threefold division of the "Doctrine of Elements or Principles," treated in section i. of the systematic logic (pp. 60-214). The "Doctrine of Method," which is the subject of section ii., is divided into two parts dealing respectively with "methodic thinking in general" (pp. 215-33) and "the methods of knowledge in the particular" (pp. 234-69). Under this last head comes the theory of inductive and deductive logic as ordinarily treated.

Die Principien der Wahrscheinlichkeitsrechnung. Eine logische Untersuchung von JOHANNES VON KRIES. Freiburg i. B.: J. C. B. Mohr (Paul Siebeck), 1886. Pp. xii., 298.

This is a new attempt to furnish the mathematical theory of probabilities with a logical basis. The author rejects, first of all, the doctrines that would make "subjective probabilities" the basis of calculation; the "degree of actual expectation" being, like intensity of feeling generally, incapable of measurement. That, as logicicians usually say, two events are equally probable when there is no assignable (objective) ground for expecting one rather than the other, is true, but is insufficient to define the characteristic property of numerical probabilities. The principle the author himself proposes as a basis is, "that suppositions stand in a numerically assignable relation of probability when they embrace original fields of play (Spielräume) indifferent and comparable in respect of their magnitude, and that accordingly there result determinate probability-values where the totality of all possibilities can be exhausted by a number of such suppositions" (p. 36). This is described briefly as the principle of "Spielräume". All of the book that is not historical or critical,—the greater portion,—is taken up with the application of it.

Heraklit von Ephesus und Arthur Schopenhauer. Eine historisch-philosophische Parallele. Von GOTTLOB MAYER. Heidelberg: C. Winter, 1886. Pp. 47.

A comparison of Heraclitus and Schopenhauer as regards the theoretical basis of their philosophy, its pessimistic outcome and its determining factors. The author finds that the phenomenalism and pantheism of both philosophers rendered it impossible for them to attain to any true ethics and made their pessimism inevitable.

Lotzes Aesthetik. Von FRITZ KOEGEL, Dr. phil. Göttingen: Vandenhoeck und Ruprecht, 1886. Pp. 138.

An exposition of Lotze's æsthetic views. The author intends at present to give only the outlines, and does not deal with questions relating to the

special arts. The chief source for his exposition has been the *Geschichte der Aesthetik in Deutschland* (1868), but he also makes full use of references to æsthetic questions in Lotze's other works.

Het Vraagstuk van den zedelijken Vooruitgang. Door Mr. M. C. L. Lotsij. Eerste Stuk: Begrip van Zedelijkheid. Utrecht: J. L. Beyers, 1885. Pp. v., 139, and (Appendices) xxxi.

The author showed the quality of his work some years ago in an original and vigorous commentary on the philosophy of Spinoza (see MIND, Vol. iv. 431). The present book (of which only the first part is yet published), is an endeavour to construct a theory of ethics on the footing of scientific psychology. The author's view of morality is determinist, empirical, and in a certain sense egoistic and subjective. It is distinctly not utilitarian; he seems to regard J. S. Mill's utilitarianism, for example, as an illogical compromise with the commonplaces of unscientific thinking. For what he calls "apriorism" in every form he has nothing but contempt. Indeed this book, like its predecessor, is not a little disfigured by the constant disparagement of Kant, who is classed as "utilitarian from top to toe". Certainly it may be argued that the final cause of Kant's categorical imperative is in ultimate analysis not distinguishable from the final cause of human action expressed or assumed by the systems commonly known as utilitarian; but to call Kant an utilitarian on the strength of this does not tend to clearness of either historical or philosophical conception. In rejecting utilitarianism, the author does not accept egoistic hedonism. Like Mr. Leslie Stephen, he regards morality as essentially a function of man's social nature. It is curious that he does not mention either Mr. Stephen's work or Mr. Herbert Spencer's *Data of Ethics:* he gives some pages to criticism of M. Guyau, and is fond of citing Prof. Bain, Dr. Maudsley and Buckle (whom the printer has turned into "Buccle"). Judging by the company he keeps rather than by his express utterances, he appears to be of those who imagine that psychophysic and cerebral physiology are going to make philosophy superfluous. Nevertheless he is clear and sound on the point that morality is not a sum of actions or something inferred from actions, but a state which determines action, herein agreeing with the best moral philosophers of all schools. His merits, and to a certain extent his defects, would make his writing especially congenial to English readers, if they could read it. But not many in this country can be expected to face Dutch, though the trouble of mastering it for reading purposes need not be formidable to any one already in possession of English and German.

RECEIVED also:

J. T. Cunningham, *Charles Darwin* ("Round Table Series"), Edinburgh, W. Brown, pp. 32.

H. Pratt, *New Aspects of Life and Religion*, London, Williams & Norgate, pp. xiii., 396.

A. Vogel, *Philosophisches Repetitorium:* i. *Geschichte der Philosophie*, 3te Aufl., Gütersloh, Bertelsmann, pp. x., 181.

G. Biedermann, *Philosophie des Geistes*, Prag, Tempsky; Leipzig, Freytag, pp. xxxi., 316.

H. Voltz, *Die Ethik als Wissenschaft*, Strassburg, Trübner, 1886, pp. 55.

VIII.—NOTES AND CORRESPONDENCE.

AN ALLEGED GAP IN MILL'S UTILITARIANISM.

Professor Sidgwick believes himself to have transcended the antagonism between Utilitarianism and Intuitionism, and to have filled up a gap in the expressed argument of Mill, a gap which he thinks Mill must have, consciously or unconsciously, filled up in the same manner as he himself has. The gap is there, he says, by reason of the fact that Mill has not shown desire for the general happiness to exist in any individual, while yet requiring for proof that a thing is desirable proof that it is desired. The doctrine by means of which he intends to stop this gap asserts that we have a notion of objective "right," and that one element of this notion is self-evident, that element being afforded us by the self-evident judgment which we make—that, if a thing is right for me and not for another, it must be by reason of some difference between us two other than the fact that I am myself. The notion then being completed by the empirical knowledge that the object of our aims must be the greatest happiness, it follows that we must not direct our efforts towards ourselves unless by reason of the probability that so directing them will increase the quantity of happiness which they effect.

Whether Mill's theory is in fact incomplete or not, it is very evident that he puts it forward advisedly as a complete theory, and himself feels no gap in it whatever. For he says in his first chapter quite plainly: "Questions of ultimate ends are not amenable to direct proof. Whatever can be proved to be good must be so by being shown to be a means to something admitted to be good without proof;" and it is in the light of this statement that his fourth chapter is to be read. Bearing this in mind, we must take what Mill says to mean this:—'Were I alone my actions would be directed to my happiness, and *necessarily* to that alone, for action takes place towards satisfaction of desire, and that is the same as pleasure or relief from pain. Others if alone would also direct their actions to a similar end. If therefore I am to aid others it must be towards that end, namely, what I consider will be their ultimate happiness. There can never be generated in me a desire for others' good apart from their happiness.' This is the entire meaning of Mill's statement, that the "general happiness is a good to the aggregate of all persons". There are two assumptions here: (1) that I am to aid others, (2) that I can form no conception of good to them, and can have no desire to do anything for them, apart from happiness. In the second of these Mill assumes exactly as much (neither more nor less) as Prof. Sidgwick does in his chapter on the Ultimate Good. It is not to be supposed that Mill meant to say that all do desire the general happiness. It was sufficient for him that each desires his own happiness, that he himself desired the general happiness, that he never knew any one to desire anything other than these two, and that he wished others to desire the latter. For the rest, Mill's whole proof is negative, and can only, after what he has said in his first chapter, be negative. He examines the statements of others that they desire something else, and hopes to convince them that they desire it only as a means to happiness. He says, in fact, that, if there is only one *kind* of thing which has ever been desired, it *must* be some variety of *that* one kind which moves the will in every case, and any question of preference must be between two varieties of that one kind, for example, between my own happiness and that of others.

Mill therefore never undertook to *prove* that others' happiness should be sought, for he simply said, "Questions of ultimate ends are not amenable to direct proof". He confined himself to the proof that happiness "somewhere or other" is the only thing that *can* be desired, and this he could only prove negatively, just as he might be able to prove sound to be the only thing audible. The second assumption remains, and to Mill quite consciously, "not amenable to direct proof," a mere desire of his own which he hopes by some means to make a universal desire.

His theory is therefore complete. No conception of a moral end has been framed without the implication of happiness. He has not himself framed one without that implication. He therefore believes that we cannot conceive any actions taking place otherwise than towards happiness. Assured therefore that no one can consciously aim at anything but happiness somewhere or other, his task is to instil the desire of happiness of others, but he declines the task of *proving* this. There is certainly here a possible gap, *if only it can be filled*:—to prove to me, an egoist, that I *ought* to seek others' happiness. How does Prof. Sidgwick fill the supposed gap?

Prof. Sidgwick seems to be, as stated above, very much in the same position as Mill in regard to the question of happiness being the ultimate aim; but the other part of the question he solves by finding the self-evident principle mentioned above. But whence does this principle in reality derive its self-evidence? It is simply from the fact that it is an analytic and not a synthetic proposition. The word "right" in itself connotes a regard for other people. Prof. Sidgwick certainly would evade this, if possible, by declaring that we do not regard with indifference a man who neglects his own happiness simply because he does not care for happiness; but it is only necessary here to remember that no action, or forbearance to act, on my part, is indifferent to others. My happiness always affects that of my children and that of those who are around me.

Nothing that Prof. Sidgwick has said of objective right will obviate the necessary implication of regard for others (even though it might eliminate regard for their praise or blame of myself) in my notion of right; he has himself given up the task of proving to any one that he ought to do something objectively right. "I at least (says he) do not know how to impart the notion of moral obligation to any one who is entirely devoid of it," and he has only proved happiness to be the ultimate good with as much cogency as Mill himself. That there has been any gap filled up therefore cannot be maintained. Both seem to be at one in fact and only different in name. But perhaps a difference lies in this, that to Mill "desirable," though not including all that is desired, connotes a *desire in some one*. The "ought" passes out from some one who has conceived a desire (the possibility of advance in this desire covering all that Prof. Sidgwick has been able to bring forward on "objective right"). Mill's one resource therefore to prove a moral end is to instil a desire for it in any possible way. Prof. Sidgwick simply says that every man ought to know that there is something which ought to be done and that part of this something is self-evident.

Certainly it is evident enough that if I "ought" to do *anything* I "ought" to respect the claims of others; but the question is, Is it self-evident that I "ought" to do anything? Prof. Sidgwick says it is self-evident—self-evident to him; but this simply means that *he* desires the claims of others to be respected by each. The "ought" corresponds to a desire of his. Just what Mill had said.

If then the Intuitionists are willing to accept this reconciliation (with the proviso always that it may some day be possible to frame a conception of a moral end without happiness,—just as possible as it may be to frame a

conception of a body unextended), the Utilitarians can have no objections. It is all Mill wished for. What else could he mean by his first chapter?

Melbourne. JAMES SUTHERLAND.

ATTENTION IN PERCEPTION.

Permettez moi de présenter à vos lecteurs une courte observation au sujet de l'excellent compte-rendu que M. J. Jacobs a fait de mon livre sur la *Psychologie du Raisonnement*, dans le dernier numéro du MIND (juillet 1886). L'auteur combat le rapprochement que j'ai essayé d'établir entre la perception extérieure et le raisonnement logique, en soutenant que ce qui sépare profondément ces deux actes, c'est que le premier est accompagné d'attention involontaire et le second d'attention volontaire. Je ne relèverais pas ici cette opinion—qui est toute personnelle à l'auteur, et qui ne me paraît pas inattaquable (car un grand nombre de perceptions, par exemple les observations du micrographe, exigent un effort d'attention volontaire et soutenu)—si M. Jacobs ne partait pas de là pour affirmer que j'accorde peu d'importance au phénomène de l'attention. C'est une erreur complète. J'ai indiqué à plusieurs reprises (p. 157 et p. 159) le rôle joué par ce que j'appelle avec Lewes *l'attitude de l'esprit;* ce terme n'indique pas autre chose qu'une orientation déterminée de l'attention. Je me propose d'ailleurs de consacrer un jour une monographie à ce phénomène, le plus obscur peut-être de toute la psychologie.

A. BINET.

THE ARISTOTELIAN SOCIETY FOR THE SYSTEMATIC STUDY OF PHILOSOPHY.—The annual business meeting, closing the seventh Session, was held on Monday, June 7. The Report of the Committee, which contained suggestions for printing and publishing an Abstract of Transactions, was approved and adopted. All the officers of the Society were re-elected for the ensuing Session, the first meeting of which was fixed for Monday, Nov. 8, at 22 Albemarle Street, at 8 p.m., when the usual Presidential Address will be given by Mr. Shadworth H. Hodgson: subject, "The Re-organisation of Philosophy". For information regarding membership, cards of admission, and programs of work for the next Session, application should be made to Mr. E. H. Rhodes, Hon. Sec., 11 Norfolk Road, St. John's Wood, N.W.

In the latest No. of the *Philosophische Monatshefte* it is announced that Prof. P. Natorp of Marburg will now be associated with Prof. Schaarschmidt in the conduct of that journal.

THE JOURNAL OF SPECULATIVE PHILOSOPHY.—Vol. xx. No. 1. B. P. Blood—Philosophic Reveries. N. M. Butler—The Problem of Kant's *K. d. r. V.* J. M. Rigg—The so-called Primary Qualities of Matter. Goeschel—On the Triplicity of the Proofs of Immortality (trans.). Notes and Discussions, &c.

REVUE PHILOSOPHIQUE.—An. xi., No. 7. Stricker—De la parole et des sons intérieurs. Ch. Féré—Impuissance et pessimisme. J. M. Guardia—Philosophes espagnols: Oliva Sabuco (i.). Rev. Gén. (Durkheim—Les études récentes de science sociale). Variétés (Ch. Henry—Loi d'évolution de la science musicale). Analyses et Comptes-rendus. Rev. des Périod. No. 8. H. Joly—La sensibilité et le mouvement (i.). J. Delboeuf—De l'influence de l'éducation et de l'imitation dans le somnambulisme provoqué. G. Noel—L'idée de nombre et ses conditions. Analyses, &c. (A. Seth, *The Scottish Philosophy*, &c.). Société de Psychologie Physiologique (L. Manouvrier—Mouvements divers et sueur palmaire consecutifs à des images

mentales. Ochorowicz—Sur le problème de la suggestion mentale. Pierre Janet—Deuxième note sur le sommeil provoqué à distance et la suggestion mentale pendant l'état somnambulique. No. 9. H. Joly—La sensibilité, &c. (fin). P. Tannery—La théorie de la matière d'Anaxagore. J. M. Guardia — Philosophes espagnols : Oliva Sabuco (fin). Variétés (P. Tannery—Une lettre inédite de Descartes). Analyses, &c. Rev. des Périod. Soc. de Psych. Phys. (Ch. Richet—Une observation de somnambulisme. Hoctés—Graphologie et personnalité). Correspondance (G. Jorissenne—Sur le langage intérieur).

La Critique Philosophique (Nouv. Sér.).—An. ii., No. 6. E. Blum —Contribution à la théorie de la vision. C. Renouvier—Le christianisme et la doctrine de l'évolution (suite). F. Pillon—Un ouvrage récent sur l'alchimie (suite). L. Dauriac—Education et enseignement. Notices bibliog. No. 7. C. Renouvier—Le christianisme, &c. (suite). F. Pillon —Les conférences de M. Robert Flint sur le théisme. L. Dauriac—Perception et déduction. L. Ménard—La transformation des croyances dans le monde hellénique. F. Pillon—A propos de la chaire de philosophie vacante à la Faculté de théologie protestante de Montauban. No. 8. F. Pillon—A propos de la théorie spenceriste de l'innéité mentale. C. Renouvier—Le christianisme nihiliste. F. Pillon—Encore un mot sur la chaire, &c. Notices bibliog.

Rivista Italiana di Filosofia.—Vol. ii., Disp. 1. N. Fornelli—Esposizione generale delle teorie pedagogiche di Herbart e della sua scuola. R. Benzoni—La simpatia nella morale dell' evoluzionismo e nel sistema Rosminiano. T. Ronconi—Un libro del Prof. F. Bonatelli contro la relatività della conoscenza. Bibliografie, &c.

Rivista di Filosofia Scientifica.—Vol. v., No. 6. T. Vignoli—Il periodo prelitico umano. F. Puglia—G. Romagnosi e l'odierno evoluzionismo giuridico. L. Friso—Il positivismo in Italia : R. Ardigò (ii.). Note Critiche (E. Tanzi—Ancora sulla sensibilità termica). Riv. Sint. (M. Pilo—La natura organica del carattere umano). Riv. Bib. (H. Spencer, *Ecclesiastical Institutions*, R. Flint, *Vico*, G. C. Robertson, *Hobbes*), &c.

Zeitschrift für Philosophie, &c.—Bd. lxxxix., Heft 1. F. Sattig—Der protagoreische Sensualismus u. seine Um- u. Fortbildung durch die Sokratische Begriffsphilosophie (ii.). C. Stumpf—Ueber die Vorstellung der Melodien. F. v. Medveczky-Baerenbach—Einige Gedanken über die Ziele u. Wege der Ethik. Anonymous—Streifzüge über die Philosophie der Gegenwart (ii.). Recensionen.

Philosophische Monatshefte.—Bd. xxii., Heft 8, 9. E. v. Hartmann—Der Begriff des Komischen in der modernen Aesthetik. G. Knauer —Weiteres zur Kantischen Lösung des Problems der Freiheit. Recensionen (J. Royce, *The Religious Aspect of Philosophy*, R. S. Perrin, *The Religion of Philosophy*, &c.). Literaturbericht. Bibliographie, &c. Heft 10. T. Achelis—Lotze's praktische Philosophie in ihren Grundzügen. Recensionen (N. Porter, *The Elements of Moral Science*, &c.). Literaturbericht. Bibliographie, &c.

Vierteljahrsschrift für wiss. Philosophie.—Bd. x., Heft 3. H. Höffding—Die Principien der Ethik. L. Busse—Ueber die Bedeutung der Begriffe 'essentia' u. 'existentia' bei Spinoza. B. Erdmann—Zur Theorie der Apperception (i.). A. Marty—Ueber Sprachreflex, Nativismus u. absichtliche Sprachbildung (iii.). Anzeige (T. Fowler, *Progressive Morality*). Selbstanzeigen, &c.